BIRDS & BEASTS OF THE ROMAN ZOO

KNOTTNERUS-MEYER

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BIRDS AND BEASTS OF THE ROMAN ZOO

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BIRDS AND BEASTS OF THE ROMAN ZOO

Some observations of a lover of animals

BY

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TRANSLATED BY

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PART I

INTRODUCTION

THE crest of the wave is followed by the trough, not only in the eternally changing picture of the sea, but also in the life of Nature. This is true of the individual creature and of life as a whole. Natural history and human history teach us the same lesson. Often the trough, the depression, is lasting: the recovery is no longer possible; and then we speak of the downfall of races, of peoples, of whole States and cultures.

It is the same with spiritual life and spiritual endeavor. Schopenhauer's renunciation of the world is followed by Nietzsche's philosophy of affirmation, of the will to live and the will to power. Away with the compassion inculcated by Schopenhauer! And Descartes, with his doctrine of an inanimate Nature, a world of animals whose higher types even are inanimate, was of necessity followed by the reaction which we are accustomed to call simply Darwinism. While Descartes set man far above all the animals and regarded him as the only animate creature, Darwinism broke down all spiritual and bodily barriers between man and the animals and saw in man merely a specialized animal, highly developed in one direction—the intellectual. Whatever one may think of this doctrine—and today the majority of scientists have renounced many of its dogmas—it has at all events done this

much good: it has given a fresh and unforeseen impetus to natural science and in particular to the study of animals. The Darwinian period saw the foundation of most of our zoological gardens, and also the publication of Brehm's "Tierleben," which has become, as very few books have become, a national possession, and a credit to Germany all the world over. It was in this period that we began to take a renewed interest in animals, inquiring into the nature of their minds and endeavoring to approach them mentally, in order to learn something of their inner life.

Alfred Brehm was a pioneer and he achieved his aim, which was to arouse interest in and affection for animals. Whoever reads his book must become a lover of animals. But since the days of Brehm, who sought understanding and intelligence in the animals, and found what he sought, there has come yet another reaction in the shape of a more restricted animal psychology which recognizes only innate instincts and tendencies, denying to the animal all the higher mental faculties and emotions. Before man, on the contrary, it calls a respectful halt. But we may be sure that this doctrine, born and elaborated in the study, will not long remain on the crest of the wave. It will find opponents not only among all those who have daily intercourse with animals, and know and love them, but also among many competent experts.

The truth, as is so often the case, lies between the two extremes. Those are wrong who regard the animal as something almost human, and those are equally wrong who conceive it merely as a living machine. And

yet the tendency to humanize the animal is one that it is impossible entirely to avoid; for how can we think and judge in other than human fashion, proceeding from the human standpoint? From this standpoint we make our comparisons, from this we draw our conclusions, and all that lies without the range of our ideas, beyond our possibilities of comprehension, remains a mystery, a secret; and such, as Fabre has so finely said, is the inner life of the animal.

It is quite conceivable that the animal mind is not simply more sensitive or more obtuse than our own, but entirely different in its nature; but who can say that this is so, and who can assert the contrary? Is not the conspicuous sense of direction which many creatures possess a sheer enigma to us? Can we explain, for example, how the rhinoceros—by no means a highly intelligent beast—is able to find the shortest path to the nearest water-hole, across the lifeless sands of the desert, while a man, with all his intelligence, reason and learning, will die miserably of thirst?

How do we contrive to understand the action and behavior of our fellow-men? Only by virtue of conscious or unconscious comparisons: by a reference back to ourselves. And how difficult it often is to understand, not merely people of other races or of lower culture, but even those of our own fellow-countrymen whose education, professional vocations, and social position have induced in them other ideas and points of view! We know that this very mutual incomprehension of the different classes of the population is the origin of some of the most serious political misunderstandings

of our time. We are too far reduced by the proposition that all men are equal and equivalent. This is a most grievous error. Only the recognition of its falsity can make our common life more endurable.

The mode of thought of a negro, the fatalism of the Oriental—these to us are equally incomprehensible. We can of course become acquainted with them, but we cannot conceive of them, cannot sympathize with or experience them.

And yet there are those who want to "explain" everything about the animals, which physically and intellectually are much more remote from us. Those who presume to do so, who think with professional wisdom to understand and solve the "riddle of the universe," are sinning grievously against the true scientific spirit and against humanity itself. We are forever, and only too soon, reaching the limits of our knowledge; and where knowledge ceases, there, in Haeckel's words, "faith enters into its inalienable rights."

To understand those that stand on a lower intellectual level than ourselves, whether these be men or animals, we must endeavor to step down to them, to enter into their lives. In this assertion there is no intellectual arrogance; that should and must be absolutely put aside. But if we want to study children, for example, and to live with them and *fully* understand them, we have to base our world of ideas on that of the child—that is, on a lower and more primitive world—and to step down to a lower level of intellectual development. This explains why children and simple folk

with childlike ideas and intuitions have a better understanding of animals than many more learned people, or the unfortunate inhabitants of the great cities, to whom Nature is a stranger.

What divides us from the animals is not the fact of intellectual development, but merely its differences of level. It is true that the behavior of animals is often and in many respects the result of inborn tendency—that is, of instinct. But is not this true also of man? Human behavior is often susceptible of a far simpler explanation than is at first apparent. It is frequently based upon innate and inherited instincts of great antiquity. Consider human love, which was in its origin purely sensual: the love of parents for their children, and of children for their parents. What is here but an inherited instinct, absolutely necessary to the maintenance of the race? Of the same nature is man's noblest endeavor, to set himself in the brightest possible light before the great herd we call humanity: to insure himself, even at the cost of his fellow-men, a good place in the sun. This arises out of the social life of human beings and the resulting fierce competition of the struggle for existence. Hence, too, results the unconditional fight for the possession of woman, before whom one suitor tries to oust the other, not always with harmless weapons and sometimes with catastrophic results. All these phenomena are found again among the social animals, as Heinroth has pointed out in his beautiful study of the ethology of the Gansidae.

We are only too accustomed to regard all human actions as reasonable; yet this view is fundamentally

erroneous. Few people have any conception of how great a part is played—even in man—for example, by the sense of smell. Theory, apparently valid but actually untenable, asserts that man is purely a seeing animal, and that the sense of smell is in him of quite secondary importance. Yet this sense plays an enormously important part in our lives, though for most of us its action may be unconscious. It is the decisive factor in attraction and repulsion, friendship and hatred. For example, what an effect has the fragrance of a woman's hair upon a man! We speak of "an unsavory fellow," and the phrase embodies a profound truth; only it is a truth of which we are no longer conscious, just as we are no longer conscious that every human being has a specific and personal bodily odor. This is proved by the fact that a creature with a keener sense of smell, which employs it consciously, continually, and obviously—for instance, the dog—will recognize the individual persons known to him from among thousands, merely by their scent.

Many of the animals' senses are to us incomprehensible. I will instance the sense of locality or direction, which is none the less always to be found in Nature's children. Others are quite outside the range of human capacities; as, for example, the animal's faculty of finding water (*vide* the rhinoceros), and the sensitiveness of the ant to the ultra-violet rays of the solar spectrum, which our senses are unable to perceive. We are uncertain even of the significance of the median line in the fish; it is apparently the organ of a sense which we do not possess, and probably serves to

apprise the fish of the undulatory movements of the waves.

It is often said that animals are incapable of abstract thought, and the lack of language is instanced as the most certain evidence of this incapacity. But the assertion and the proof are alike erroneous. As a matter of fact, animals do possess a language of sounds and gestures which expresses all possible feelings, as hunger, pain, contentment, joy, anxiety, fear; and one who knows animals can understand, from its gestures and uttered sounds, exactly what the animal is trying to express. This, of course, is true only of the higher animals. Any one who is acquainted with the apes, the larger cats, the wolf, the horse, and the parrot knows that they have a distinct feeling of right and wrong, and that they manifest a sense of guilt, joy, and grief, which is related to abstract thought.

What the animal lacks is the power of handing down written thought from generation to generation. In this capacity resides a part of the vast superiority of man. This mode of transmission is found even among the more primitive peoples. On the other hand, animals do possess a sort of oral "tradition." This word is used by Lloyd Morgan in his book on "Instinct and Habit." It is due to tradition, for instance, that young Barbary ducks, when following their mother in a public park, where they have no enemies, and come into daily contact with human beings who are not dangerous to them, behave themselves quite otherwise than in a state of complete freedom. Their behavior is based on tradition transmitted by the mother, who has already

adapted her own behavior to her altered conditions.

All their lives animals gather experience and adapt their behavior accordingly. They are guided by consciousness. With increasing age their capacity for mental development declines; it is greatest in youth. This is true in general of men also, chiefly and most remarkably in the lower races; for example, the negro, when barely twenty years of age, is as a rule already incapable of further intellectual acquisition.

Needless to ask whether animals think. Those who know them know that they think and consider—each, of course, in its own fashion and according to the degree of its mental development. An ape must think as an ape, a parrot as a parrot, just as a man can think only as a man. A European does not think as a negro thinks. Even the superior races think quite differently; a German thinks differently from a Frenchman, or an Englishman, or an Italian. But they all think.

In our zoological gardens—and it is of them that I shall write in this book—the animals are compelled to adapt themselves to conditions wholly novel and unnatural, or to succumb to them. The strictest limitation of their freedom of movement, the complete alteration of their methods of feeding, and above all the absence of the compulsion to seek their nourishment, together with the close captivity of animals used to freedom, and the enforced and intimate intercourse with man, the greatest enemy of the animal world, are some of the chief factors to be considered as affecting the animals of our zoological gardens. And the

higher the class, order, family, or species of animal stands in mental development, the greater must be the effects of these factors for good or ill. At the head of all stand, of course, the apes, and among them the anthropoid apes, the species most highly developed and most nearly approaching to man, both in their physical and their mental constitution.

What is set forth in the following chapters is the substance of my observations and experiences collected during many years of intercourse with animals. It is difficult to express the charm that animals can lend to life: it must be experienced. And the knowledge and experience which one acquires and accumulates when one strives to know and to fathom, as far as is possible to our all too insufficient human powers, teach us human beings the virtue of modesty. The belief of Faust's famulus, and of many another Wagner, that we have "done such magnificent things," is shattered when we see that what today is announced as "scientific fact" is tomorrow superseded or recognized as erroneous, and only this knowledge is left: that our science is and will remain fragmentary. The really great problems of life which have power to move thoughtful men will always be problems to us. But the recognition that we must beware of intellectual pride must also bring us closer to the animals. To awaken love and sympathy for them—even my artlessly written records may serve to do this. If they give my readers as much pleasure as they have given me, they will have achieved their aim. They are written with warm and heartfelt love

for the animal world, and if I may make a personal remark in respect of myself, it is that I number myself among the few fortunate ones of the earth in whom avocation and inclination completely coincide.

THE AUTHOR.

BIRDS AND BEASTS OF THE ROMAN ZOO

THE CHIMPANZEE

WHILE it is always interesting to watch living animals and their mental and emotional behavior, none are more interesting to observe than the anthropoid apes. To these apes belong four species—the gorilla, the orang-utang, the chako, and the chimpanzee, the long-armed gibbon of Southeastern Asia being no longer placed among them, but in a family of its own (*Hylobatidae*), next to the anthropoid apes. The gorilla and the orang-utang very seldom reach our shores, and hitherto the former, with very few exceptions, has never been able to endure captivity for long. One such exception, in Breslau, lived in captivity for thirteen years.

The chimpanzee has the most vivacious character among the anthropomorphs; the orang-utang and the gorilla are more reserved and dignified. Specimens of the first two species may often be seen in zoological gardens, and always amaze the observer by their astonishing intelligence. I have only once seen a live gorilla —in the Berlin Aquarium. The little creature already bore within it the seeds of death, and died not long afterward. It had been brought from the Cameroons

by Captain Dominik. When I approached the little fellow in his cage he folded his arms on his breast and looked up at me with a gaze that I shall never forget. In it was a commingling of timidity, reproach, malignancy, and a look of mortal sickness. The whole expression of his face was amazingly, I might say depressingly, human. When I approached the little waif more nearly he struck out at me to hold me off. Captain Dominik rightly calls the gorilla "a superior and aristocratic animal." Its regard and confidence have to be won almost by force; it is not, as is the chimpanzee in its early youth, full of the joy of life, and everybody's child. I could only regard the little waif, sick to death as it was, with the greatest compassion, and I could not bring myself to visit it a second time.

The chimpanzee commonly comes to our zoological gardens from the west coast of Africa. There it is the best known of all the anthropoid apes. Only once, to the best of my recollection, has a chimpanzee been brought to Europe from the east coast; this was the fine black-faced Soko, who lived for several years in the Berlin Zoo. Of all the anthropoid apes, the chimpanzee endures captivity the best and is most temperamental. Like most apes, it is a genuine optimist, always cheerful, and is therefore a welcome exhibit in our zoological collections.

It is peculiarly interesting, when one has the opportunity of observing a number of chimpanzees, to compare their various temperaments and characters, or to watch the development of their character over a

term of years, as visitors to the Berlin Zoo were enabled to do in the case of the fine Cameroon chimpanzee Missie, whose fame justly spread beyond the limits of the capital. To those who saw Missie as a child, and saw her again later, when she had become a young woman (if I may call her so), it must at once have been evident that her likeness to the human species had continually decreased with increase of years. Her body, hands, and muscles had grown to positively uncomfortable proportions, but her head had not followed suit; in relation to her body it became smaller and smaller. Her mind likewise did not keep pace with her body, while her character had changed for the worse. Formerly Missie used to romp with children and receive visitors in the waiting-room. Later on, this was no longer possible. She was no longer reliable, and would if roused have been a terrible adversary for an unarmed man. The fact that its mental development ceases, while the head and brain stop growing, comparatively early in life, chains the ape down to the level of the beasts. And due to the fact that their mental development ceases in early youth, while their physical strength is still slight compared with man's, such chimpanzees and also such lions and tigers as are destined to perform in public commonly begin their training while no more than four to six years of age. It is interesting to follow the education of such a performer. We often see, in a variety show or circus, what a chimpanzee is capable of learning; it will ride a bicycle, smoke, play cards, and so forth. If we observe such

a chimpanzee while its education is proceeding we shall be struck by the quite astonishing powers of comprehension of this highly intelligent animal.

His trainer has only to do a thing quietly and accurately and the chimpanzee will straightway do the same thing on his own account—that is, as long as the game pleases him. When it is done, the trainer must show what *he* can do, in order to retain the ape's respect; otherwise, the pupil may go off the rails and even be insolent to his lord and master. On such occasions chastisement is sometimes necessary, just as it is with human children, to make him stick to his lessons: at all events in outward seeming, though he may be thinking of quite other things!

While watching Hagenbeck's merry Max at his bicycle practice I could not refrain from laughing when the rogue, apparently so attentive, would cast a quick glance out of the window of his gymnasium as he went by—or when he steered his wheel close alongside the wall in order to give me a smack as he passed my corner—or, quick as lightning, to snatch with his right foot at my umbrella while his left foot diligently rotated the pedal. If as the result of such extravagances he had a spill, the silly expression with which he gazed at his trainer was indescribably comical. How was it *his* fault?

It is not every one who is able to "work," as the showmen say, with apes, nor can any one work with any ape indifferently; for such highly developed animals as the anthropoid apes have naturally very strong affections and antipathies. Max loved his trainer and

YOUNG CHIMPANZEES
Wilhelm and Lilli on the bed; Essau in the foreground; August with eyes closed in the chair. In Hagenbeck's Tierpark

PIPPO AND GRETI

even slept in the same bed with him. He knew all the secrets of the dressing-room and was beautifully well-behaved as long as he knew that he was being observed. The ape's love of order and cleanliness for their own sake is never very remarkable; but it is wonderful how far an ape can be taught good manners. He will, for example, walk upright, wear clothes, and eat with knife and fork. It is significant that an anthropoid ape will perform his tricks most perfectly and be less liable to err in his part when he is wearing a hat, coat, and trousers. But even then he may forget himself. For example, one evening, in a Berlin circus, a chimpanzee entered the ring "quite the gentleman." He was walking round it in a dignified manner, when he caught sight of two soldiers at the ringside. He can have been no friend of soldiers, for uttering grunts in which the initiated could at once read his wicked intentions, he went straight up to the two men, who, with the rest of the public, had no premonition of evil but merely laughed. Each would probably have received a terrific box on the ears had not the appearance of the trainer checked the impulse, while a word from his master recalled him to the self-conscious bearing of the gentleman-ape. Another chimpanzee, Moritz, had the impertinent habit of tearing off his boots and clothes, with which he bombarded the spectators, and of spitting at them.

Max was eventually given a comrade, August by name. Unlike Max, he was still quite untrained and was in all ways his complete antithesis. The one was confiding, impudent, and full of healthy mischief, as an ape

should be; the other timid and retiring, becoming a little more lively only when he believed that no one was watching him, and especially in Max's company. When a human being approached him he ran away. If one followed him he screamed with terror, and took particular pains always to cover his hands and feet, and to turn his broad back on his visitor. Apparently the poor fellow had previously had a rough time; it seemed as though he must have been teased a great deal, perhaps on board ship, and had also been struck, particularly on the hands. If one tried to seize one of his hands he hid it, and bit, or screamed with terror. The keeper contrived at last, by the greatest patience and affectionate treatment, to induce him to take food from his hand. But August, when loose in a room, preferred to have Max sit between him and the person feeding him. He would reach past Max quick as lightning and then as quickly turn away to protect his hands. This ape had a peculiarly shrill voice. The voice of the chimpanzee in general varies greatly, not only between different species, but also between individuals of the same species. Another peculiarity of August's was his behavior when a visitor entered his room; he used to beat excitedly on the wall with his knuckles.

His relations with Max became quite good in course of time. They were not so in the beginning. The cheeky Max used to challenge August to come out and play with him, but the timid fellow would cling tight to the side of his cage, the result being that Max would resort to force. Holding fast to the bars in the corner of the cage, he would kick the shrinking August soundly with

both feet—a form of ill-usage much in favor with the chimpanzee. Gradually August learned to protect himself, and thenceforth a more peaceful intercourse prevailed. I remember one very comical scene, when Max tenderly embraced his friend. Apparently this was by no means pleasing to August, for he bit Max in the arm. A short outcry and a ringing box on the ear from Max was the result—such a buffet as a butting sheep might receive when playing with children. Later on, Max and August became good friends, who were sure to get into some sort of mischief when alone in the room together—such as breaking the windows, and so forth. August gave evidence of the great muscular strength of even a young chimpanzee, for his keeper repeatedly found him, on returning after a short absence, with his sleeping-box at the other end of the room. Sitting in the box, which was no light burden even for a couple of men, August had moved it right across the room, performing this remarkable trick by gripping the bars of the cover and pushing with both feet against the wall of the cage. Such sleeping-boxes must of course be very carefully secured, for our worthy cousins are great masters in the art of extracting screws and so on. If they can manage to snatch the keeper's bunch of keys, the door will soon be unlocked; and it is a remarkable fact that the cunning fellows generally find the right key after a trial or two. They have not watched the keeper in vain!

Their employment of such an implement as a key makes it needless to ask whether the apes are capable of the conscious use of tools. A particular skill in the

use of keys was displayed by an elderly chimpanzee, Virginia by name, who tried, perhaps for an hour, to open the two doors of her cage with a key which her keeper had given her. She presently realized that the key did not fit the lock, and became more and more excited, and when the keeper re-entered the room she threw the useless key in his face! If the right keys had fallen into her hand no lock would secure her, and she could open any window. She had scarcely been installed in her cage, when she reappeared, having removed one of the boards of the roof, and at once began to struggle with the window; however, she readily followed her master, who had accompanied her from France. Unlike Max, Virginia was in other respects a peaceable creature, though lively and very affectionate. On the other hand, she had little regard for cleanliness. She did not at all like having her face washed, and it was no less willingly that she surrendered her hands and feet to be scrubbed; whereas Max found washing a most interesting process. He took a particular delight in splashing the water about. It was a great joke of his, when he thought his attendant was not observing him, to dash both his feet into the water, so that it splashed up into the keeper's face. The truth of Wilhelm Busch's assertion, that "cleanliness is not a matter for jesting," had not yet been impressed upon him.

Max had little sympathy with Virginia. If he was passing her cage, he would silently spring, quick as lightning, at the bars, and trample against them with his feet until they rattled fit to break—an attention which Virginia returned in kind. Or he would get hold

of a stick and strike out at the lady. Chimpanzees are very fond of striking blows with a stick. Virginia herself, like Max, trod the boards later on.

A lady chimpanzee of a different character was Gretchen, or Greti. Confiding, even though rather timid, she willingly allowed herself to be washed; she was not shy of the water, like Virginia, but in other respects had no great regard for cleanliness, although she was extremely vain. She liked to pull on a jacket, and would proudly gaze at it and stroke it, never pulling it off or tearing it. Gretchen expressed her delight, when an acquaintance entered her cage, by uttering the most cheerful cries and stamping with her feet. On such occasions in particular, when safely enthroned at the top of her cage, she was extremely voluble. Her voice, unlike August's, was deep and powerful. Later on, Gretchen was respectably married to Sambo, from the South Cameroons. He, as a healthy chimp should be, was a bundle of crazy tricks. His treatment of Gretchen was at first anything but amiable. As far as possible he took everything away from her; however, all went well until the gnawing at her stomach proved too much for the patience of even this peaceful soul, and she gave her youthful lord a few powerful bites whenever he was insolent. After this he became quite amiable. He would even carry her about, as mother apes carry their young, especially when he had been parted from her: a comical sight! Woe to him who annoyed or molested Gretchen! —he had Sambo to deal with; and Sambo fell upon him with the first stick that came to hand. On the other hand, it was impossible to pet either of the married

pair, for they quickly showed their jealousy. Gretchen would reach over Sambo and pull away the hand that stroked him, and would scratch or pinch it, while Sambo would strike at the hand that caressed Gretchen.

A giraffe had its enclosure near their outdoor cage, and with this Sambo became very friendly, though at first he used to threaten it with stick or umbrella. The great beast used to sink its long neck and stare at the little fellow, standing there on his hind legs, with a shy, questioning expression, quite unable to make him out—for the giraffe is not an intellectual light in the animal world. It was touching to see Sambo when his former master came to see him; Sambo had lived with him some years in the Cameroons. On these occasions his joy knew no bounds; with shrieks of delight he would fall upon his old master's neck.

The memory of animals for individual persons, and their attachment to them, are altogether remarkable, especially in the animals of our zoological gardens, who often see thousands of faces daily. Thus, the Berlin chimpanzee Missie used to greet me every time she saw me, even after a long interval, with cries of joy, and would hold out her hands, that afterward grew so uncannily large and clumsy. On one occasion, some years ago, I re-entered the Berlin Zoo after an absence of six months or so, just as Missie was performing gymnastics in the highest branches of an oak-tree. When she heard my voice she came down like a flash and leaped at me, throwing her arms round my neck. She then, as of old, searched my pockets for grapes, just as though I had never been away. Her first owner,

too, Major Langheld, and his wife, who had reared Missie as a baby in the Cameroons, and presented her to the Berlin Zoological Gardens at the age of two, were always welcomed with especial heartiness. On the other hand, Missie regarded a well-known explorer with lasting enmity, because he had once boxed her ears. Other visitors might make a long stay, but she could no longer bear him to be in the room.

Little Missie had a remarkable passion for swinging on a rope, holding by one hand and with the other knocking off the hats of her male visitors as she swung past them. She once reduced a beautiful silk hat of my own to a wretched condition, while another visitor had his hat driven right over his ears, so that he stood there stupefied; the thing had been done so quickly that he really did not know what had happened to him. On such occasions it was comical to see the little creature's expression of mischievous delight.

She was peculiarly gentle with young children, especially with little girls, and would embrace them caressingly. Missie's birthday—which the keeper used to announce more than once in the year—was always a treat for the children of Berlin, and Missie most gratefully received a great variety of presents, such as sweets, fruit, caps, slippers, and jerseys.

This love of teasing, as shown in the smashing of hats, found yet another expression. A cage containing other apes (meercats, etc.) lay at a right angle to Missie's. She would show them her blanket through the grill of her cage and hold it out to them, immediately drawing it back if they tried to catch hold of it. This

seemed to be a plain case of *Schadenfreude;* it was as though she took a malicious delight in showing her comrades that she possessed something which they did not. Needless to say, several blankets were destroyed in this way. To the East African chimpanzee, Soko, who was afterward placed in this adjoining cage, Missie behaved with complete indifference. She took as little notice of the surly old fellow as he took of her. This was a great disappointment for those who had eagerly looked forward to the moment when Missie should once again, after an interval of years, catch sight of another chimpanzee. Apparently this behavior was due simply to intense jealousy, especially on Missie's part; for at that time she was still too exclusively attached to her keeper. An encounter in the same cage might well have resulted in a mortal combat. Confined in separate cages, Missie and Soko simply took no notice of one another. Similar behavior may be observed in the case of dogs.

I must not forget to mention Hagenbeck's Moritz, a memoir of whom will be found in Hagenbeck's "Von Tieren und Menschen." It was in the summer of 1907. Moritz, like all chimpanzees, was quick in learning to ride the bicycle, and would often run wild on his machine. On such occasions he would ride out of the *Tierpark* through the main entrance, in order to snatch a few bananas from the barrows of the itinerant fruit-sellers who used to be stationed there, returning home with his favorite delicacy. The deftness with which Moritz committed these thefts as he rode past was both astonishing and diverting.

MORE ABOUT THE CHIMPANZEE, AND SOMETHING ABOUT THE ORANG-UTANG

GRETCHEN, the vain chimpanzee beauty of whom I have already spoken, came eventually to the Roman Zoo and is still living there. In the course of years—and it is more than fourteen since we first became acquainted—she has become a magnificent specimen of her race, but her pretty, child-like ways are things of the past. As in the case of Missie, her head has not grown as fast as her body; the animal element has become more and more obvious.

Gretchen and I have never become really good friends, although she will greet me with a great show of rejoicing and dutifully give me her hand. But if I approached her in her cage—which I have not ventured to do for some years past—she always took some such liberty with me as trying to break my stick or tear my clothes. If the keeper were present he could soon reduce her to order, but her behavior was even worse if he allowed her to do as she liked. One might often hear the shrill, angry, broken battle-cry which the chimpanzee utters when about to attack, usually with the arm raised to strike. When one hears this it is time to be on one's guard.

In other zoological gardens than ours one hears and sees that the chimpanzees in particular have little liking for the directors. This was the case with Missie

in Berlin. The reason for this is simply jealousy. The chimpanzee has naturally an affection for its keepers, and persons who are in a superior relation to the keeper, and give him orders, are distasteful to the ape; the more so in that they do not wear a uniform. An intelligent animal like the chimpanzee is fully aware of such details. It is also a well-known fact that regimental dogs often hate the officers of their regiment.

But Gretchen's antipathy or hatred for me lies deeper than this; it has its foundations in her excellent memory. In the summer of 1910, when I was acting as scientific assistant in Hagenbeck's *Tierpark*, Gretchen was still a small, lovable, helpless little chimpanzee child. On her left shoulder she had a suppurating bullet-wound, which for some weeks required surgical treatment. The wound had to be drained and irrigated, and this was done by the veterinary surgeon; but for several weeks he was absent on a journey and I had to undertake the office. Little Gretchen's arms had to be held behind her back, while a thick handkerchief was stuffed into her mouth and tied behind her neck to prevent her biting. The keeper and an assistant held her fast while I saw to the cleansing of the wound. The little ape was of course more frightened than hurt. The wound healed in time, although no hair ever grew over it, and for a long while afterward Gretchen, instead of going on all fours, preferred to take hold of her legs and hobble about on them, although she has always been rather weak in the lower limbs.

Gretchen has never forgotten the dressing of her wound. Toward the end of the summer of 1910, when

she was living with Sambo, she often attempted, if I approached her, to incite Sambo to attack me, by uttering her war-cry; but always without success. She would also try to snatch at my hand and to snap at it.

In Rome Gretchen at first had much to contend with. Her house was not yet ready, so she had to remain in her traveling-cage in the common monkey-house, and only occasionally did the keeper let her out for a walk, which had to be taken along the barrier in front of the monkeys' cage, to the sound of their triumphant outcries. Later on she exchanged her narrow cage for the roomy apartments of the anthropoid apes' house. However, she retains a kindly recollection of her first keeper, who now, every Friday, takes the place of the regular attendant in the apes' house, and is extremely fond of him.

At first she was given a companion in the shape of a young female mangabe, for whom she felt a tender affection. This extremely gentle creature had to put up with a good deal. Above all things, Gretchen loved to carry her about at her breast, as though she had been a baby. "Come willingly, or I'll make you!" was the order of the day. Then the little mangabey, Scimmietta (Little Monkey) by name, clinging to the bars, would have her tail pulled until she literally sweated; Gretchen often hanging on to her tail with the full weight of her body. In the evening, when it was time for bed, Gretchen would press her little friend to her breast, and the two would disappear into the sleeping-box, where they slept in a close embrace. When Gretchen was taken for a walk, holding her keeper's

hand, Scimmietta would accompany her, quite at liberty. She never attempted to run away, although she was not really hand-tame, and could hardly be induced to approach and take food from one's hand.

The mangabe, by the way, always carried her tail bolt upright when taking exercise out of the cage. She may have done so instinctively, in order to protect it from unexpected assault. The two friends took an especial delight in showing off before the other monkeys, leaping about in front of their cage, just as though they wanted to tantalize the prisoners! This sort of attention was not always too amiably received the other side of the bars. One must beware of allowing the chimpanzee to go too near certain other simians—for example, the baboons—or he might have a very bad reception.

A disturbing element in this friendship, as far as Scimmietta was concerned, was Chechina (a diminutive of Francesca), a young female cheetah from Somaliland, with whom Greti quickly formed an affectionate friendship, which lasted until Chechina's death when some three years of age. It was always a charming sight to see them romping together until they were tired—first in complete freedom, and then, as they grew too big, in Greti's cage; a sight that always attracted a large circle of spectators and greatly astonished them, since the cheetah always passed for a panther, or even a tiger. Chechina, who was given her full liberty in the chimpanzees' house, since she always remained perfectly tame, used even to call attention to herself if she wanted to visit her friend Gretchen. As

a rule, she was the first of the pair to tire of play, and then Gretchen would hang from the bars and with both feet would trample on Chechina's body, by way of inviting her to further play; a kind of massage which we preferred to spare the cheetah. Greti was very fond of holding on to Chechina's long tail and allowing herself to be dragged about. Thanks to Chechina's pacific nature they never quarreled or fought; at the worst, Greti would receive a few sharp cuts from Chechina's forepaws—and the cheetah can make most excellent use of its paws. All other species of feline carnivora have retractile claws, but not the cheetah. The delightful spectacle of a cheetah playing with the chimpanzee was of course exploited by the cinematographer.

Like Scimmietta, who always fled to higher regions when the cheetah was present, so Pippo, Gretchen's later companion, who succeeded the mangabe, could never make a friend of Chechina. Pippo was a fine young chimpanzee, whose face was white, whereas Greti's was black, and he was in another particular a contrast to Greti, for whereas she had not a strong growth of hair, Pippo was very hairy, even on the head. He came from Havre, where he had lived in the house of an Italian importer of animals and had been accustomed to play with the dealer's little boy. This little boy, who had given him the pretty name of Pippo (a diminutive of Philippo), accompanied his friend to Rome. In intelligence Pippo was markedly superior to Gretchen, and although he was two or three years her junior, he became her master. He was also physically much more active, danced very well, and

was likewise a good jumper. All went well from the very beginning. Greti, indeed, was at first rather jealous of the new arrival, but Pippo was bold as brass, so they soon understood one another. Both learned to swing themselves, and sat in the swing with their legs hanging down. Greti would stand upright, with Pippo on her shoulders. Pippo would give the military salute, and both ate at table in a seemly manner with fork and spoon. Only if the keeper became inattentive did the hand come into play, or the mouth unceremoniously approach the plate; or one would steal what he could from the other, or jump from the chair to sit on the table, or play other tricks of the kind. Their education was of course superficial, and to be always well-behaved is as tedious for chimpanzees as it is for children.

Greti and Pippo regarded it as a special treat when their cage was washed out. Then indeed they loved cleanliness, but only as a lark! Two favorite tricks of theirs were to jump into the water, or splash it about, and to upset the bucket. They liked being washed, but never bathed of their own accord; all my attempts to induce them to do so failed. Even in a state of freedom chimpanzees hardly ever enter the water, as the rhesus and Java monkeys are so fond of doing. To the best of my knowledge the reports of travelers confirm this point.

One of Pippo's greatest pleasures was to leap with all four hands against the bars through which the wondering crowd was staring at him, and so startling many a spectator. Apes in general are very fond of teasing.

But if any one were present when the keeper came his rounds, Pippo had a way of throwing potatoes, apples, or less appetizing things through or under the grille at his visitors, and his aim was good. He would look back at them between his hind legs, and throw through them.

Those very chimpanzees who in other respects are most intelligent are incredibly dirty in their habits, as may be seen in any zoological garden. For this reason the greatest cleanliness is essential, and often severity on the part of the keepers.

The Roman Zoo is fortunate in possessing as chimpanzee keeper a man who has genuine love of animals. In spite of the widespread opinion that the Romans are harsh to animals, one often finds this love of animals among the Italians. This keeper taught his charges all the tricks I have mentioned by kindness only. They love him and obey him at a word. It is not always advisable to strike one of the larger chimpanzees; they only too readily become refractory, and are then very dangerous. The trainer's superiority must be moral rather than physical.

The language in which this keeper addresses his apes is most amusing. Having spent five years in Stuttgart and Mayence, he knows a little French and German. His "chimpanzee language" is therefore a sort of Esperanto. "*Sitzen!*" he cries (only he pronounces the word as *tsitza*) ; "*Viens ici!*" "*Ubbedisce!*" and so forth. The French of course reminded Pippo of Havre, and the German, even in the form of *patois*, must have aroused recollections of Stellingen.

In the course of time Pippo and I became very good friends. He would shake hands with me—and, of course, next moment would knock off my hat. A young and healthy chimpanzee is simply obliged to play tricks of this sort. Greti, on the other hand, would greet me with loud shrieks of delight, and would allow herself to be stroked through the grille, but if I entered the cage she would fall upon me without more ado. Once in the summer she was climbing round the fence of the ostriches' enclosure, when I came up and attempted to play with her. For a moment all was well; then she uttered her loud battle-cry, sprang to the ground, and tried to bite my legs. Exerting all my strength, I controlled the creature, which possessed the enormous muscular power of all the anthropoid apes, by forcing her shoulders down until her face was pressed against the grass, while she clutched with both hands at my calves. The intervention of the head keeper, who carried the excited creature away in his arms, rescued me from an unpleasant and dangerous situation. The spectators had not realized my danger, but were amused by the supposed friendly tussle; just as those watching the performance of a group of trained lions or tigers believe the trainer to be in danger when one of his animals growls at him or resists him, while an actual danger is not realized. For Greti the consequence of this behavior was that she was no longer allowed to stroll about at liberty.

On another occasion the chimpanzee-keeper entered the cage and thoughtlessly left the key protruding inside the lock. I had remained outside, in the keepers'

YOUNG BABOONS

A MONKEYS' PARADISE
Monkeys in pine-trees

gangway. To unlock the door and slip out was for Greti the work of a moment, and uttering her wicked war-cry she rushed at me—I, as usual, being without weapon of defense. At that moment the head keeper came up and threatened the ape with an iron rod; at the same time her own keeper ordered her back, and she retreated, uttering cries of rage. Against such an animal a man is more helpless than against any of the great cats, for these can be intimidated; a raging ape cannot. It hears and feels nothing. Fortunately, like her keeper, the head keeper was a friend of Greti's or she would not have obeyed him. Greti's behavior shows how a vicious animal, or one with vicious feelings, never forgets but bears a lasting grudge.

Greti made a last attempt to attack me one day when, with a friend, I entered her cage by a door connecting it with the neighboring cage. Not far from the door Greti and Pippo were sitting at table. My friend wanted to take a photograph. The keeper stood by the table; Greti was sitting with her back to us. While Pippo, although he looked up at us, went on eating, Greti kept on turning round and looking first at me and then at the keeper. She dared not get up in the latter's presence, so she suddenly raised her hand and struck out at me, uttering a shrill scream. I pushed my friend through the door and followed him. He of course had not realized the danger of our situation—of mine in particular.

I made a curious experiment with these two chimpanzees. If I blew my huntsman's whistle, which I always carried for calling the keeper, they fled in alarm

to the top of the cage and would not come down again until I had gone. They presently understood that I carried this whistle on a key-chain in my left-hand trousers pocket. If I then gave them chocolate, or held my watch, in which they were keenly interested, against their ears, or stroked them, they would always glance timidly at my left-hand pocket, and would disappear in a flash if I put my hand in it. Gradually their fear diminished, and in order to remove their distrust of the devilish instrument I handed it over to them; but all the keeper's efforts to induce them to blow it were unsuccessful. First Pippo tried, but neither he nor Greti could ever understand that it was necessary to expel the breath, not to draw it in as they both did. They sucked at the whistle until they tired of the game—and an ape is very soon bored—and then threw it away. The intelligence of the pair was not equal to understanding that the whistle must be sounded by the expulsion of breath—proving that they have no idea that their own vocal utterances are caused by the same act, but that they are instinctively produced.

The worthy Pippo died of influenza during the war.

After five years' absence from Rome I found Greti still living. She had become a powerful creature and had retained a lively, almost youthful character. She has now lived for sixteen years in Europe, and fourteen in the Roman Zoo. This is surely a record! She recognized me unmistakably, after gazing at me sharply for a little while; and this after five years!

She now has for her companions a pair of young hamadryas baboons. Of these she prefers the female,

and is jealous of the little husband. If she can get hold of a stick, she tries to beat him, while the baboon, indignantly screaming, stands his ground.

Greti's aversion for monkeys with long tails is remarkable. An Indian "slender monkey," a *Budeng*, had to be removed from her cage. With alarming speed and dexterity she chased the perfectly harmless beast, who was yelling with fright, all over the place. Gigetto, a not especially handsome capuchin monkey, aroused her to even greater wrath. Long after he was taken away she ran to and fro, screaming with excitement. What underlies this aversion? I can only suppose that the monkeys' long tails are disagreeable to Greti. Sex has nothing to do with it, for the budeng was a female, and Gigetto a male.

Very young chimpanzee children are delightful little things. Years ago I saw many of them at Hagenbeck's. One of them, August, was very fond of drink when he could get it. Another, of a very hirsute appearance, was appropriately named Esau. The prettiest, however, were Wilhelm and Lilli. Lilli, who, although such a tiny thing, had yet something quite motherly about her, and was for this reason also known as Mutti, was very sensitive and eager for affection. She looked delightful in her little red frock, and liked to wear it, whereas August was out of his clothes again almost as soon as they were put on; he tore them off himself. Wilhelm was very jealous, particularly if one petted Lilli; he allowed only the keeper to do this. If any one else did so he would come up, grunting, and try to dash his right hand into one's face, preferably

into one's eyes, after which he ran off with squeals of triumph, continually looking round. This form of attack may often be observed in young chimpanzees, and in otherwise harmless older individuals. In young chimpanzees the great individual differences in their facial formation, and in their way of moving, and especially of behaving, is already striking; each of the little creatures is already a personality.

Unhappily, they often die of a scurvy of the gums, a scorbutic malady. The mouth smells most horribly; the gums bleed and the teeth fall out. Of the cause of the disease, and whether it is perhaps due to unsuitable diet, we unfortunately know as little as we do of the means of curing it. In any case, it is epidemic in character and highly contagious, so that the affected ape must at once be isolated from those who are still healthy or have recovered.

The orang-utang is, in character and intelligence—in which he is decidedly inferior—the exact antithesis of the chimpanzee. The first orang-utang I ever saw much of was little Rolf, in Berlin, who used to exercise with Missie, then herself in early childhood, on a little knoll near the new apes' house. He was fond of hiding behind Esau, who was then growing fast. As regards the public he was good-tempered, but always retiring and rather timid. He would never be left alone in the waiting-room, but would try to get hold of the key so that he could return to his cage. If left alone outside the cage he would retreat into the keepers' room and there await his keeper, sitting quietly on the table. Orangs are almost entirely devoid of the love of teas-

ing and playing pranks. In their movements they are more like big chameleons than anything else; one sees the same slow, mistrustful groping, followed by the firm grip, and the equally slow progress. They have, too, the same curiously stiff way of holding their limbs, so that even their quicker movements seem to be made quietly. Even when playing and sporting, a curious melancholy seems to oppress these creatures.

As regards the zoo and its visitors, therefore, they are far less entertaining than the cheerful chimpanzees. The great superiority of the latter was evident when the chimpanzee Moritz was living with the orangs Jacob and Rosa in Hagenbeck's *Tierpark*. To this chimpanzee Karl Hagenbeck devoted almost a whole chapter of his delightful book "Von Tieren und Menschen." Jacob and Rosa had to do as Moritz wished. The little female was the more intelligent of the two orangs. It was pretty to see them playing with a little Somali boy. They had been brought up in the house of a Sumatrese farmer, and roamed about the *Tierpark* quite at liberty.

In the year 1911 I bought at Havre an older orang, a wicked fellow. If one approached him, and when he was excited, he uttered the well-known cracking tones, which were followed by a gurgling grunt, and flashed his hand out through the bars, but always drew it back again immediately.

He was confined in a small traveling-cage, little better than a packing-case, in which he could hardly stand upright. Close under the roof a wooden bar was fixed across the box, and to this he liked to hold fast

with both hands. In this narrow cage, which had bars only in front, and in the small ship's cabin, the orang looked enormous. It is because they are exhibited in low, narrow cages that beasts in a menagerie always look so large and seem to possess correspondingly powerful voices.

The orang's cage was now closed in front with a shutter, so that only an opening of perhaps a hand's breadth was left at the bottom. In this packing-case the ape was taken on a hand-cart to the railway station. A most amiable Frenchman, who spoke German fluently, a sort of ship-broker, who also dealt in animals, undertook everything for me; for which I was all the more thankful, as our head keeper was expecting to meet me in Paris on the following day. This versatile person so contrived matters that I was able to declare the orang and a few smaller animals on my railway ticket as personal luggage. He knew more than I about the manners and customs of the country. So, with my new acquisition, I journeyed to Paris, the train arriving at St. Lazare at nearly nine o'clock instead of eight, being more than three-quarters of an hour late by the state railway time-table. But I had asked the inspector of the *Jardin des Plantes* to send an animal van to the station to meet the eight o'clock train, as the director had kindly consented to receive the beast and keep him in the apes' house until I could continue my journey to Rome. When I arrived no van was there. All my searching and questioning were fruitless. I therefore returned to the cloak-room and found the porters gathered together and laughing loudly. The object of

their merriment was my orang, who in his anxiety had thrust his hands through the gap at the bottom of his box and had then been given a cut on the hands with a short, thin iron rod. Naturally he became enraged, shook his box, and was subjected to further teasing. As a result the box was turned upside down, so that he was standing on his head. At this sight I forgot all my innate Prussian discipline and order, sprang over the counter of the cloak-room into the midst of the gathering, swearing alternately in German, French, and Italian, struck out right and left, and delivered my orang from his distressing position. As a German writer of verse has observed, "Virtue needs to be awakened; but one can work evil of one's self." Accordingly, I pressed a five-franc note into the hand of a quiet, elderly porter, while the rest quickly melted away, for by this time a couple of officials had appeared. This porter promptly secured for me the last cab obtainable —a tall *fiacre* with a very low iron rail round the slightly convex roof. Upon this the box was hoisted. The trouble was that the box, over five feet in height, had to be stood upright, and was naturally insecure on the curving roof. However, my worthy porter did his work well; he made the box fast with cords, and so, with the smaller animals on the driver's box, we set off for the *Jardin des Plantes*, distant more than half an hour's drive. The orang was still terribly excited, shaking his not over-secure box, which rose to a considerable height; so that the tall body of the cab swayed continually from side to side on its high springs, and the faster the vehicle rattled over the cobbles, the more

furiously did the orang rage aloft. On the asphalt, matters were better, but I kept on moving from one side of the cab to the other, to balance the weight of the frantic anthropoid. We were already close to the *Jardin des Plantes*, when the near wheels, as we turned a corner, dropped into a rut where the road surface was broken, and the cab was nearly overturned. The thought flashed through my mind: what should I do if the cab were overturned? The box would break open and the malignant creature would be free—and I was unarmed! "Who knows," I thought, "but what the escape of the orang will be set down as the evil deed of an accursed Prussian, as an assault on Paris, the center of culture and civilization!" For this was the summer of 1911, the year of the Morocco incident. But at last we reached the entrance gate of the *Jardin des Plantes*. Only after long ringing did any one appear. All was dark, but *M. l'Inspecteur* was at home. I sought him immediately and amiably enough taxed him with his forgetfulness, whereupon he informed me that he had expected a further telegram from me! I then begged him to call some of the keepers, so that we could take the orang to the apes' house and feed him. "*C'est impossible!*" Why? Because my lords the state employees in this land of liberty, equality, and fraternity may as a matter of principle work only eight hours a day! Even the keepers in a menagerie! The hours in summer are as follows: 8:00 to 11:00, cleaning; 11:00 to 1:00, dinner-time; 1:00 to 6:00, on duty. Thus the public are enabled to visit the menagerie during just five hours of the day, and those the hottest hours. Well,

the Parisians put up with it and it is their own affair. But on me, of course, the inspector's "*impossible*" made no impression. I declared that I myself would fetch the keepers out of their official quarters, and that in view of the *pourboire* which would naturally be forthcoming they would surely not refuse their services. The inspector agreed. Three keepers came up, loaded the orang and the other animals on a handcart, took them to the apes' house, made tea, and gave some to the orang, together with some bananas and some excellent French white bread. Delighted with their generous *pourboire*, they returned to their quarters. I, however, did not neglect to seek out the inspector again on my way to the exit, as I felt impelled once more to express my thanks for his "great amiability," even though I might disturb him in the act of going to bed. Perhaps he was one of the *grands patriotes* of Déroulède's *Ligue*. After I had told him how matters had been arranged, he asked me repeatedly, perhaps out of forgetfulness: "*Monsieur, vous-êtes Allemand?*" to which I replied each time with an embarrassed smile and the addition: "*Et un vrai Prussien.*" This fact apparently made him feel quite affectionate toward me. However, I got to my hotel at last after this instructive and memorable journey, in time for an eleven o'clock supper. Two days later all was ready for the journey to Rome, and thanks to the officials at the *Gare de Lyon* all went smoothly on our departure. Incidentally, indeed, the orang reached out of his box, caught the head keeper by the neck, dragged him to the bars, and would have bitten him in the face had not the keeper, being a practised

hand, managed to free himself. The extremely obliging young assistant inspector had provided food for all the animals, and escorted the orang and myself to the station.

Our arrival in Rome was fittingly celebrated. In all probability this was the first orang-utang to enter the Eternal City! A jocular member of the administrative council christened him Esau, for he was reddish in hue and shaggy as a bear, as was the first-born of the patriarch Isaac of old. The unkind opinion was expressed by some that he was not so very unlike his godfather! Be this as it may, no one had much joy of Esau. Visitors to the Zoo often complained that he would not show himself in all his beauty at the bars of his cage. As a rule, he sat silent in a corner. He took no notice whatever of a rhesus monkey which we gave him as companion. He was equally unfriendly to his keepers. Four months later he died of an attack of asthma, after only a brief illness. His lungs were spongy and congested, and shortly before his death he himself drew two threadworms (*filaria*) from his throat, each about four inches in length.

After some years Esau's place was filled by a pair of orangs, who were purchased in Trieste—Marco and Antonio by name. Marco was small and thickset, good-tempered and tame; Antonio, who was larger, was thin, timid, and unsociable. He would not allow himself to be touched, and would try to conceal his hands, and was also given to spitting. Marco, on the other hand, was allowed to walk at liberty in the gardens, but he

always moved with the orang's peculiar timidity, from which only Hagenbeck's Jacob and Rosa were to some extent free. He was fond of hiding under the palm-trees or going quickly into one of the little refreshment-houses, and there he would sit in silence. Marco was very fond of putting a cap on his head. He was on fairly friendly terms with the chimpanzee Greti, whereas Antonio declined her advances and even bit her, for which he was of course most untenderly handled. On the whole, however, the relations between the orangs and the chimpanzee were not very cordial, and it was impossible to let them be long together.

The orangs' longing for concealment is often highly inconvenient. If one leaves them their blankets during the daytime they wrap themselves up in them, and the visitors complain that they cannot see them. At night Marco and Antonio did not sleep together, but each in his own box. The docile little Marco died, quite suddenly, at the end of some five months. The autopsy revealed fatty degeneration of the heart. Possibly the long confinement in a small cage during the journey to Europe and at the dealers', and the slothful, sedentary habit of the orang, even in the largest of cages, may have favored the development of this disease. Antonio, after Marco's death, became still more unapproachable, refused his food, and died shortly afterward. The cause of his death could not be determined. He may have died of sheer loneliness, although after Marco's death he was given a companion, Scimmietta, Gretchen's

earliest playfellow, but he would not take any notice of her.

A dear little creature was a young female orang which I saw in 1901 in the zoological gardens of Cologne. She had come into Germany the year before, in company with two other orangs, one of which died, while the other was sent to Frankfort-on-Main, and a young pig-faced baboon, with which she was now living. This little orang was of a most confiding nature, as were the two Hagenbeck orangs of which I have spoken, and on the friendliest terms with the baboon, which accompanied her on her walks abroad. She was like a clever, well-behaved child, would give you her hand cordially and frankly, and used to embrace the keeper as a child might have done; and if bidden would put on his cap. She was never cross, even when the baboon made life a burden to her. If the keeper tried to catch the baboon he would suddenly spring unawares on to his shoulders; it was his great delight to steal the keeper's cap, or to throw it away, a thing the little orang would never have permitted herself to do.

A sort of mystery encompasses the orang, what with its lonely life in the forest, its peculiar red coloring, and its remarkable figure, with the short, thick body, the endlessly long thin arms, the short thin legs, the prominently swollen cheeks of the Borneo males, the throat-pouch peculiar to all the males, and the curious little conical head with the tiny, round, melancholy eyes. This is expressed in its very name; *orang-utang* means "man of the woods." Its peculiarly reserved and dull and usually melancholy nature, often malicious in

older animals, is, to us, always alien and enigmatical. Of all the apes in our zoological gardens, the chimpanzee, with its sanguine temperament and its gift of mimicry, will always be the most interesting and sympathetic to us human beings.

MONKEYS IN CAPTIVITY

MONKEYS are in all respects highly intelligent animals. In the state of freedom they lead an unfettered, vagrant life. In captivity these lively, sanguine creatures often live together in narrow cages, in large companies of various species which possess the most varied characteristics. Movement is restricted, occupation lacking, and an oppressive *ennui* prevails. Their diet is only a poor substitute for that offered by a life of freedom, and they become increasingly jealous and grudging in respect of their food. In the state of freedom this jealousy has less reason to exist, and the necessity of being constantly ready to contend against enemies of all sorts compels the troop to hold firmly together. In captivity, on the other hand, a general state of war prevails; each ape's hand is against every other ape.

The strongest male is an absolute despot, unhampered by any sort of constitutional restrictions. Most monkeys live in captivity, as in freedom, in a state of polygamy. But the lady monkeys, with their own younger offspring, and even those of other origin, often constitute a very regiment of women and contrive to subject even the otherwise unapproachable chieftain to their petticoatless government.

The half-grown or weaker males constitute the bulk of the monkey troops in our zoological gardens. The

chieftain will often watch without participating in the squabbles of his band; but now and again, if the chief himself be of a pacific nature, the disturber of the peace will receive a resounding thwack.

New arrivals, weakly individuals, and above all sick or feeble animals have always much to suffer. Compassion is, as a rule, unknown. On the other hand, the tender care lavished on the young born in captivity is very striking. Their mother and their father, or putative father, the chief of the tribe, have the utmost regard for them, and all the inhabitants of the monkey-house take a lively interest in the birth of such youngsters.

Genuine friendships are seldom to be observed. As a rule, the stronger males will band themselves together only to undertake some common piece of mischief. Remarkable, on the other hand, is the almost motherly care which an adult male will lavish on his smaller brothers, often going about with several of the little fellows always at his heels. As for the pasha's wives, they hide the bitterest mutual enmity in their hearts, even when there is an empty show of harmony. And with our simian cousins it is often enough the tender sex that indulges in domestic politics. But that leadership is always necessary was once upon a time shown in Hagenbeck's *Tierpark*, after the arrival of a large cargo of hamadryas baboons. All the smaller baboons were put together in a very large cage; then, as a constant state of warfare prevailed among the youngsters, a few old baboons were added, such as in a state of freedom would have acted as leaders. Peace resulted; a

glance from the eyes of one of the austere elders was enough to quiet the younger set. For the worst cases a little boxing of ears was most useful.

Monkeys are very active in the matter of foreign politics, their relations to the inhabitants of a neighboring cage being those of match and powder; they are therefore seldom correct, and still less friendly. Only the princes of the two communities are given to expressing their mutual esteem, outwardly at least, and from a distance, by lively gestures, and that exhibition of the hinder parts to which Mark Twain has referred. Diplomatic complications are seldom of any service. With terrible shrieks, behind the safe protection of the wire trellis, the two hostile armies take the field. The more daring distinguish themselves by their especial zeal in battle; but owing to the presence of the trellis they can seldom do more than touch one another's finger-tips. If they succeed in doing this their shrieks of rage are redoubled. This makes a good impression on those in high places, and by his prowess the fighter may avert their impending wrath.

A frequent cause of faction is the former cage-mate, who, generally because of his quarrelsome disposition, has been deported and finds himself compelled to win social recognition in his new environment. The exile, like a true renegade, in order to prove his loyalty, mobilizes his new friends against his former comrades. Family or racial consciousness is strong in all apes, and in captivity it is emphasized by the constant companionship of animals of the most various races and species. For example, all the baboons in a monkey-

A MONKEYS' PARADISE
Monkeys on leafless mulberry-trees

house will fly into the most furious rage if one of their kinsmen has so much as a hair ruffled. Between species which are mutually somewhat remote—as the baboons and the macaques—such intimate relations rarely exist as between, let us say, the rhesus and the Java monkey.

If young baboons are kept in captivity with older monkeys of a different species they may be treated to an oppressive degree of affection, but the macaques will never go to sleep beside them. On the other hand, when living with adult baboons the feebler but nimbler-witted macaques contrive to make themselves the virtual rulers of the cage. Thus, years ago, in the zoological gardens of Cologne, I saw, amid a company of perhaps a dozen hamadryas baboons, one single paltry macaque who had virtually appointed himself the *spiritus rector* of the troop. He knew how to win the favor of the mighty, for which reason the humble feared him. He watched for every nod and gesture of the leader, and if any harm threatened himself he was always able to divert the storm on to the head of some other member of the band, usually a younger male.

Monkeys are apt to be cruel to beasts of other orders until these enforce proper respect by a vigorous use of their teeth; then they suddenly become tolerant. This was the case with two anteaters in the Hanover Zoo. But the monkeys—always lovers of warmth—soon learned to value the warm plump backs of the anteaters, which they employed as hot-water bottles, even more than their personalities. On the other hand, they were fond of dragging the harmless armadillos behind

them up the trellis, for the pleasure of letting them fall; or they would go for rides on their backs.

All monkeys, even if born in captivity, have a great and instinctive aversion to snakes or snake-like animals. In Hanover I often watched their behavior in respect to eels. Their curiosity impelled them to watch the eels, lying at the bottom of the bathing-pool; they would stand beside the pool on tiptoe, ready, the moment an eel moved, to seek safety at the top of the cage, shrieking with terror. Rats and mice, on the other hand, if ill-advised enough to enter the cage, are killed by the united efforts of the community, a tug-of-war being fought over the remains. Cockchafers, crickets, and the like are eaten alive. Flies are caught by hand in a very sportsmanlike manner.

The large baboons are generally kept in pairs, in separate cages, and in such cases their mutual behavior is modified, and the husband and wife often develop a tender regard for one another. This is the more remarkable in that apes and monkeys are almost always polygamists.

In Hanover a pair of hamadryas baboons were separated. The separation lasted for nine months, during which time the animals could not see one another; they could only hear each other's voices. By chance I had the good fortune to be present when they were reunited. The wife, Eva, had to pass down a long corridor to reach her husband's cage. In her excitement she announced her approach to Adam by loud barking cries. Adam answered her, became more and more excited, for the cries sounded nearer and nearer, and gazed in

suspense at the sliding door. This moved back and Eva appeared. For a few moments they stared at one another motionless, then, with a long-drawn howl of joy, they fell into each other's arms, gazed at one another once more, and again embraced; and so continued for a long while. Not until much later did they proceed to the mutual ceremony of the toilet so justly beloved by their kind.

Some years later Eva was given a new husband, a young baboon who had not yet acquired the full coloring of maturity. She seemed to cherish no particular feeling or respect for the newcomer. One day the young couple were diligently searching the hay on the floor of their cage, when suddenly, without any perceptible cause, both began to make rapid chewing movements and to lift their eyebrows—a sign, in the baboon, of profound and increasing mental excitement. Suddenly there was nothing to be seen but flying hay and tufts of hair. The battle raged in absolute silence. A few minutes later the pair were sitting peaceably together, and continued at peace thereafter.

Another example of marital affection was afforded by a brown baboon. When his wife died he seemed at first to take no notice of her death; he thought she was sleeping, and obeyed readily when led away from her, in the belief that she would follow him. When he realized that he was mistaken, and the dead baboon was taken out of the cage, he raved with grief and rage. All day he sat in a state of apathy, refusing to eat. An orphaned child survived the mother, and although in her lifetime he would never touch it, he now tended it

lovingly till the day of its death, although with the curious helplessness so often seen in human fathers. Some time afterward he was given another mate, but he repelled her, despite the amiability with which she displayed her person and her charms. A long while afterward he took a wife of the Langheld baboons, but his relations with her were never very affectionate.

The jealousy which monkeys display when mated was well shown in the case of a young magot in the Berlin Zoo. In the early spring he was given a brownish-black macaque for his mate. Both monkeys had formerly been very friendly with me, and always shook hands with me. Yet now Peter could not bear me to take his young wife's hand, or even to look at her; and if I did so he would promptly throw a handful of sand into my face. Nor was she allowed to flirt with the monkeys in other cages.

As regards a monkey's relations with human beings, the first impression which the monkey receives of men is usually the deciding factor. If the newly-caught animals are treated wrongly or with cruelty, they are generally spoiled for life; otherwise young imported monkeys are as a rule tame and confiding, especially the anthropoid apes. The most vicious are the old baboons, and above all anthropoid apes captured when mature, as was the East African chimpanzee Soko, who never got over the loss of his liberty or overcame his hatred of his greatest enemy, man. Apes and monkeys in general become capricious and vicious with increasing years, but even the greatest miscreants quickly become docile if bullied by stronger companions; then

they seek their keeper, and learn to value him. This is evident any day at feeding-time, when the weaker or more persecuted monkeys profit by the presence of the watchful keeper to appease their ravening hunger.

Especially noteworthy was a case which occurred in the Hanover Zoo. A fine male macaque, Kohn by name and vicious by nature, who came from a private collection, was turned out among a large troop of macaques. They all fell upon him immediately and handled him very severely. In order to rescue the unfortunate newcomer the keeper went into the cage, whip in hand. Scarcely had he entered when Kohn hastily took refuge under his coat and clung to him in terror. He willingly allowed himself to be removed, though previously the keeper could not get near him. Unfortunately, it was too late; he died shortly afterward of his terrible wounds. The troop showed no hostility toward his wife, Henny, or his ugly half-grown son, Moses; the latter lived for many years at the Hanover Zoo.

That the smaller monkeys will sometimes bully the larger was shown by two gray-green meercats in the Hanover Zoo, who shared a cage with a great mandrill, Philip, and used, when the fancy took them, to chase him all over the cage, filling the air with their shrieks, but never doing him any harm. It almost seemed, indeed, as though Philip thought this form of exercise rather good sport, and knew that it was good for his health.

The constant teasing to which monkeys are subjected in a zoological garden is unfortunately very

bad for them, making them vicious and unreliable. Monkeys, like all the more sensitive animals, are apt to dislike children if noisy or restless. It is interesting to note how perfectly the more intelligent inmates of the gardens recognize the regular visitors, even after a considerable interval. This is all the more surprising when we consider how many thousand strange faces such an animal may see in the course of a day. My own monkey friends invariably greet me with a shake of the hand or the most indescribably comical gestures.

Mandrills greet their human acquaintances by baring the teeth, drawing up the corners of the mouth, and wagging the head from side to side; also, in the case of the younger individuals, by exhibiting their colored posteriors. Sometimes, too, they utter a bleating laugh, especially when the keeper is bringing them food. Drills do the same, but I have not so far found that they bare their teeth. Mangabeys are peculiar for offering a foot to shake instead of a hand. In order to emphasize the honesty of their sentiments, I find that monkeys will often exhibit anger toward a second bystander; they are anxious to assure one of their support. A two-year-old hamadryas baboon with which I had had a great deal to do recognized me at once after a four months' absence, and warmly expressed his joy by shrieks and continual chattering, while lifting his eyebrows, after the manner of baboons, and continually putting out the tip of his tongue; he held my hand in a convulsive grip, and took no notice of the dainties offered him, which for a baboon is certainly saying a great deal.

When a monkey is angry he can usually be appeased by addressing him in his own speech. The meercats, for example, should be placated by short grunting sounds; the rhesus and Java monkeys, by making sharp movements of the lips, which are pouted a little; the pig-faced monkey, by pushing the lips into a snout; the baboons, by continually darting forth the tip of the tongue while raising the eyebrows. The monkeys themselves greet persons of their acquaintance thus when they approach their cage. The majority of the onlookers do not of course know what the monkeys intend, and make merry over their apparently foolish and purposeless grimaces.

One keeper probably owed his life to this expedient. He had often entered the cage of two old baboons, Frantz and Kaspar, in order to drive them with a broom into the adjacent cage. Nothing untoward happened until one day Kaspar, with an infuriated expression, seized him by the belt as he was about to withdraw. The keeper, who knew his beasts, at once dropped his broom, to avoid exciting the baboon any further, and addressing Kaspar in baboon language, in which idiom Kaspar answered him, he slowly left the cage, white as chalk from the fright he had received. If he had shown anger, or possibly struck the baboon, he might easily have lost his life; for baboons, like all the great apes, are terrible opponents. He never entered Kaspar's cage again, but asked his director to have a sliding door contrived between the cages which could be operated from outside.

The desire to imitate will often awaken a dormant

artistic tendency in the simian soul. A brown baboon in Cologne learned to dance on his hind legs, with his hands on his knees. At Frankfort a pig-faced monkey and a rhesus learned to turn somersaults to order—but of course only for material reward!

A MONKEYS' PARADISE

A MONKEYS' paradise? Yes. But I am not speaking of the warm native climes of our interesting relatives, who once—if we listen not to Darwin but to Heine—were fashioned in the noble likeness of man; nor yet of the rocky fastness of Gibraltar, where dwell the last of the European monkeys; but of a newly-made monkeys' paradise in Rome. Two secular pine-trees have been surrounded at a generous distance by a dry moat of suitable breadth and depth, whose outer wall is a perpendicular rampart of smooth cement. On the broad elliptical island thus created is a Swiss chalet with an upper story, which affords house-room for more than fifty of the islanders. Other smaller houses, standing on piles, are adapted for solitary individuals, mostly young bachelors. For diversions there are trapezes, tall bamboo poles, a see-saw, a spring-board above the bathing-pool, and then the bathing-pool itself, which is some eight feet in width, thirteen in length, and in the deepest place over three feet in depth.

It is obvious that when monkeys are seen thus, in a state of apparently unrestricted liberty, one receives quite a different impression of their life and activities, and of their whole behavior, from that afforded by caged animals. The impression produced is so striking, and the picture so animated, that many visitors

watch the life of the monkeys' paradise by the hour together. There is far less ugly wrangling and biting than in the cages, for these are a result of tedium. In this ample space the monkeys can more easily keep at a distance from one another, and find more distraction, and are consequently more peaceable. But there is even here, as in every troop of monkeys, an absolute and despotic chieftain, who rules like an Oriental tyrant. However, the inhabitants of the monkeys' paradise have been fortunate. Their first ruler, George I, was phlegmatic by nature; for the most part he intervened only as a peacemaker in such disputes as arose; but he intervened with energy, and would even leap into the bathing-pool, or plunge across it, in order to reach the miscreant—who usually escaped! For George's pacific soul was enshrined in a heavy body. He was an exceptionally large specimen of his species, the Indian rhesus. Rhesus monkeys make up the greater part of the community; but it also contains, or has contained, some Java monkeys, pig-faced monkeys, and a wonderfully fine Splendid macaque.

It is interesting to note how strong the racial feeling is in monkeys. They foregather according to their species. A certain Antonio or Toni appointed himself the head of the Java monkeys (or macaques, as they are called for short). Toni was once in private hands, but by reason of his increasing mischievousness he went the way of most monkeys—that is, he landed in the Zoo. He had acquired the pleasant habit, really more characteristic of the baboon, of throwing anything he could lay hands on in order to express his dis-

pleasure; even wasting in this fashion the bountiful gifts of nature—which often took the form of that farinaceous delicacy, spaghetti. Toni was a glutton; he ate all day long, seeking in all directions for something to eat. He was also a true Don Juan, and in this respect had no fastidious racial feeling; his simian heart beat warmly for beauties even of alien race. His rendezvous were held in the depth of the moat, far from the eyes of George; for him Toni feared. We had intrusted Toni's education to George after his too robustious behavior in the midst of a troop of meercats—meercats are often very touchy—and George's influence was excellent. On many occasions his heavy hand ducked Antonio in the bathing-pool; and, although Toni liked a cold bath in general, he found it disagreeable to be thrown in.

Toni entered into tender relations with the lovely Judith, the Splendid macaque. She, with the fascinating combination of her inviting face and the red and splendid obverse of the medal, made many bids for his affection. But as long as he was not in the moat he appeared the most earnest ascetic; and if George approached, or even showed himself in the distance, Toni excelled himself in persecuting Judith. The rhesus troop was of course only too ready to assist him. A perennial trick, this, of averting the wrath of those "on top" and obtaining their favor! Judith herself was familiar with this method, for as soon as she saw trouble on the horizon she disappeared into the moat, driving some unhappy wight before her—usually a pig-faced monkey—on whose head the storm now broke, to be for-

gotten a moment later, as is the way with monkeys; with them peace and war alternate from minute to minute. Once in the moat, Toni's second nature, that of the Don Juan, was again in the ascendant. A rhesus was born on the island who was plainly a bastard. Toni, the father, publicly disclaimed any relation to his offspring, and George the chieftain sunned himself in the glow of his presumed paternity.

The *Lapunders* or pig-faced monkeys are notable for their lack of racial feeling. While the solitary Judith, as a lady macaque, joined herself to the rhesus faction, the lapunder monkeys—three males and a female—were apparently devoid of any sense of community, even among themselves; yet, being powerful animals, the three males might have been a power. It would seem that even in a state of liberty these are by no means sociable, though we unfortunately know very little about their habits in the wild state.

Now as to the day's work of these islanders! They rise early, almost at the first cock-crow, leaving the pavilion or emerging from the groups roosting in the stronger branches of the lofty pine-trees, and take a cold bath—yes, even in November! From the boughs of a mulberry-tree which grows beside the bathing-pool the rhesus monkeys swing themselves boldly into the water, dropping from a height of some eight or ten feet, describing a graceful curve as they fall—for all the world like so many frogs popping into a pond. While falling they clutch continually with all four paws at the empty air. The rhesus monkeys are most expert swimmers and divers, and so are the macaques, though

these are not so fond of leaping into the water, or, at least, not from such a height; they prefer to slip in from a trapeze which is hung just above the surface. There is also a spring-board, or rather a droll and tricky tipping-board, with which they play all sorts of pranks. So they pass the time, and presently leave the water, dripping wet; but they take a few leaps, and the sun and wind do the rest; the bold swimmers are soon dry again.

About eight o'clock the keeper makes his first appearance. He descends into the moat by means of a ladder, which he then leans against the island, for monkeys are extraordinarily quick and sly and ingenious truants. Breakfast consists of good warm tea, with milk and sugar, and white bread sopped in the tea. After breakfast, about half-past nine, bathing starts again; and the bathers tire themselves out and grow quarrelsome, as is the way of monkeys. About noon the keeper appears again: heralded afar by the outposts, and then joyfully welcomed by the whole community. A cold lunch follows, the menu varying according to the time of year and the day of the week, since nothing is better for monkeys than the greatest possible variety of diet.

As far as I can tell, the monkeys do not seem to distinguish their own keepers from others at any great distance, for any keeper who comes into the range of sight is greeted with cries of joy. Lunch consists alternately of locust-beans, maize, leaves and twigs of acacia, for which they have a particular liking, or of the oak or mulberry, clover, grass, and popcorn, which

is also greatly appreciated. In summer they are sometimes given figs and cherries, and in spring sassafras-roots. At five o'clock, or six in summer, the last meal is given—a warm dinner—again varied according to the time of year and the day of the week. This may include potatoes in their skins, cooked radishes, and on rare occasions cooked meat. It is advisable to cook such things as apples, potatoes, onions, radishes, etc., whole and unpeeled, as they then keep warm very much longer. But with apples, which are especially appreciated, one must take every care that they are small, so that every islander may get his share; or the big fellows will shamelessly make off with the large apples in their hands or cheek-pouches, while the little monkeys gaze after them.

In the middle of the day in summer, and about four o'clock, and once more in the late afternoon, the monkeys again indulge in the pleasures of swimming and diving. One may see in this monkeys' paradise how necessary bathing is to the simian family; or at least to the Java monkey and the rhesus and lapunder. As for the baboons, the young hamadryases love the water, but not so passionately as the macaques; the brown and sphinx baboons do not bathe in our climate, nor the mangabeys, and the meercats but rarely. In Africa the monkeys seem to have less liking for the water. A small gray-green meercat in the Roman Zoo used to enter the bathing-pool and duck under the surface only when frightened—for example, when the keeper came with his pole-net. It would then remain constantly on the

watch, with only its head out of water, leaving the pool only when the danger was past.

The monkeys, then, live well on their island. Fruits such as apples, chestnuts, and figs being cheap in Italy, their diet is good and full of variety; and the open-air life is beneficial. Nowhere in captivity will you see such fine rhesus monkeys, of such a flawless golden-yellow. And the islanders love their home. Now and again, in the necessities of warfare, some hard-pressed inhabitant will leap down from a tall pine into a mulberry-tree standing outside the moat—an almost incredible feat—and contemplate the world—that is, the monkey paradise—from without. By the next meal-time, if not earlier, he has returned, by a flying leap, to the monkey kingdom. On the official opening of the island a great number of invitations were issued, and even the German Embassy was represented. Of course, there were photographers and cinematographers present, and in the confusion of the moment the keeper, who naturally was not yet aware of all the peculiarities of the place, forgot to pull the ladder out of the moat, but left it standing against the outer wall. Scarcely had the invited guests left the gardens when some score of rhesus monkeys mounted the ladder and left their new paradise. But by supper-time all had returned, with one single exception. It is not difficult for a monkey to leap the moat from outside, since the level of the island is lower than that of the outer wall of the moat. To cross it in the contrary direction is much more difficult, as the wall has a smooth cemented surface, and the mon-

key would have to make a very wide jump, and that from a lower level to a higher. A clear height of thirteen feet and a moat ten feet in depth are, generally speaking, enough to frustrate all attempts at flight.

This island is the first of its kind. In Hanover some monkeys were once turned out on an island in a lake, but their love of the water and their prowess as swimmers made it clear that this experiment was by no means practical. Moreover, the Roman climate makes it possible to leave the monkeys out of doors in winter, with the best results to their physical well-being. The healthy condition of the islanders and the gratifying enthusiasm of the public prove the experiment to be completely successful.

After George's death the next strongest male took over the reins of government. Unlike George, however, he was so brutal that it proved impossible to retain him as ruler. All attempts to catch him in a box-trap failed. Once George's vivacious widow, now the new ruler's consort, was taken; but he himself used only to jump on the trap and shake it until the door fell. Since the trap was of no avail, he was brought down from a tree by a clean shot through the head. The death of a monkey is always a painful spectacle. As the chieftain's dead body was carried away, his widow gazed after it from her treetop until it was out of sight. But she was inspired less by grief than by joy that her brutal husband was no more, since before the keeper had set the body down she had made a love-match in her eyrie with a new husband, whose lot hitherto had been by no means enviable. The ruling power remained in the hands of

RHESUS MONKEYS EATING CLOVER

the widow until, at a time when she was not in the best of health, a palace revolution overthrew her, and after a long interregnum a new chief of state appeared at the helm—who was not, however, the somewhat hastily-chosen new consort.

The inhabitants of the monkey paradise have a peculiarly intense dislike of strong single males. It is impossible to turn these out on the island singly. The whole community will fall upon such a newcomer, and as a rule will throw him into the water. The capuchin Gigetto, of whom I have already spoken, had to be removed after a brief sojourn, wet as a drowned rat, and others met with the same reception, so that now we release monkeys on the island only in considerable numbers. Then the interest in the newcomers is divided, and presently all goes well, especially if the strangers are youthful, as is commonly the case.

Once, when the syndic (mayor), as the keepers jocularly called the head of the community, had recently died, we turned a very large and powerful rhesus loose on the island. Risiko—as one of the assistants dubbed him—succeeded in electing himself syndic, but his rule was no more than a passing dream. Risiko knew nothing of the family relations of his subjects; he did not know that some of the little monkeys had been born on the island and therefore enjoyed the protection of the community. Brutal as he was, he ill-treated some of them, and as he also boxed the ears of the intervening mothers, the island was soon in an uproar. All fell upon Risiko, and in the end he was thrown into the water. Three young males were left on guard

at the brink of the bathing-pool, and as soon as Risiko showed signs of attempting to escape from his cold bath they sounded the alarm and brought the whole troop about them. The keeper had to intervene and rescue Risiko from his unenviable situation.

But it was impossible to lay hands on him; he took refuge in the tall pine-trees. For a whole week he remained on his airy perch, turning his back on the world and successfully defending himself against attack. He was able to come down only when the ground was clear, the other inhabitants being in their houses; then he hastily ate whatever he could find, for the most part standing erect, the better to keep watch in all directions. Only when this radical air-cure had thoroughly humbled him, and a new syndic had brought the interregnum to a close, was it possible for him to descend to earth. Thenceforth he was able to live only in the annex, the "Villa Guerra"; for he was not allowed to enter the "Villa Pace," the residence of the syndic.

THE LIFE OF A MONKEY TROOP

FOR many years I was able to observe the common life of a large troop of monkeys in the zoological gardens of Hanover. This troop was made up of Java and rhesus monkeys, capuchins, and young hamadryas baboons.

Only in the case of captive monkeys is it possible for us to make thorough and constant observations of their life and behavior; for only when they are in captivity can we keep a watch on the same animals, or observe a self-contained and isolated community. It is then, however, that their personality and intelligence reach their highest development, since they become thoroughly acquainted with one another by continual contact with the same individuals, by the constant mutual hostilities fostered by their unnatural and restricted conditions of life, and also by the manifold stimuli which reach them from without.

Inevitably they are subject to the supreme rule of the strongest, and his rule is that of an Oriental despot. As among mankind, there are cruel despots who oppress their weaker subjects, out of sheer wantonness, with bestial delight and malignancy, and keep the whole community in a constant state of anxiety. There are also others, more benevolent and more phlegmatic, whose chief desire it is to maintain peace within their

dominions. A few sound buffets will compose most quarrels, though it is not always the real culprit who receives them.

Far beneath the ruler lie the monkey people, in descending classes. There is no question here of liberty, equality, and fraternity. The monkey community was and will always be a caste community *par excellence.*

The older females who have reached the age of fertility, no matter how great their numbers, belong exclusively to the ruler; and in simian, as in human harems, jealousy and rivalry are always rife, though under the master's eye the ladies of the harem may appear to be "one in heart and soul." But the little brawls that arise in passing, and the expressions of their faces, reveal to the attentive observer, despite all feminine diplomacy, the truth of their mutual relations.

The female monkey who feels herself neglected by her lord will often seek to unite herself to some other handsome and muscular male and so avenge herself. She follows the call of her heart and has her little hour. Hers is a pure and ideal passion, such as nothing but the longing to avenge herself on her husband could ever evoke in her. I have often seen a big, powerful male capuchin and a female rhesus, in the large outdoor cage of the monkey-house, looking round for the chieftain, in apparent unconcern, and then, if he was not watching them, surreptitiously disappearing, one after the other, into some grotto, the scene of their amorous rendezvous, presently to reappear, once more singly, as though nothing had occurred. In order still further to hoodwink her lawful spouse—a worthy old

macaque who bore the name of Fritz—in respect of this love affair, which had, by the way, its natural consequence, the rhesus would zealously and as openly as possible pick a quarrel with the capuchin—merely, of course, for the sake of appearances. As a result of their brief and apparently hostile encounters the capuchin always allowed the rhesus to put him to flight, in order to avoid conflict with the supreme authority; for it is precisely the strongest males who are most sharply watched by the chieftain, and in the event of hostilities they have reason to fear the wrath of the whole community; who, like all climbers and toadies, blindly follow their leader. The majority of the troop are young males.

The jealousy and tyranny of the stronger result in a continual state of warfare, in which each does his best to save his own skin. Informers and flatterers can always make a good impression on authority. I am not, of course, referring to human society! These toadies and informers live in constant fear of their ruler, and rejoice at the close of each day if they have come off scatheless.

The old saying, *naturalia non sunt turpia*, is only too true of monkeys. Hence the unspeakably cringing manner in which this amiable class of monkeys approach their ruler, flattering him with lifted eyebrows, and baring of the teeth, and the exhibition of their hinder parts. But their greatest bliss is to clean their chieftain's coat. This is a task to be undertaken with the most anxious zeal, but also with great precaution. The slightest clumsiness is incontinently punished by a

box on the ears, or a sound thumping, and immediate dismissal.

It is interesting to note that many monkeys—for example, the macaque, the rhesus, the drill, and the mandrill—show their teeth when they wish to be ingratiating, but conceal them when excited, as when pursuing another with continual grunts. On such occasions the macaque opens his mouth, rounding and protruding the lips and *concealing* the teeth. But if he looks round at a stronger monkey he will, in order to seek his favor, instantly reassume his former expression. Baboons, on the contrary, excepting the mandrill, show their teeth when greatly enraged, after the fashion of tigers or wolves. The mandrill, when angered, nods his head and utters short grunting sounds, beating one hand against the ground. There is something positively wicked about the way in which the Java monkeys and their kin conceal their chief weapons, their teeth, on delivering an attack.

The mutual behavior of monkeys belonging to different families—for example, baboons, macaques and capuchins—clearly proves one thing—namely, that they gradually learn to understand one another, somewhat as do the beasts of a European forest; while monkeys of the same species of course understand one another from the first. Whether the sounds which they utter can be described as language is doubtful, though I am acquainted with the meaning of quite a number of those sounds. A language, in the human sense of the term, must possess words for abstract conceptions, and animals have no such words, for they have no abstract

conceptions. The various sounds which animals utter are merely the expression of mood and emotion.

Even such near relations as the rhesus and the Java monkey have absolutely different sounds to express the desire for food, or to announce the appearance of the keeper; or to express rage, terror, or the like. In the rhesus, the singing tone expressive of contentment is especially striking; it is absent in the Java monkey.

Other animals, not related to the monkeys but sharing their cage, remain aloof from the community; as do the baboons. Monkeys and the cats get on very well together; though the cat's claws demand respect and caution, as do the long, marten-like teeth of the raccoon. Armadillos are often kept in captivity with monkeys, and were always present in our community. The monkeys pull their tails, and squat down on them in order to keep their posteriors comfortably warm at bedtime; or they will even go for rides on their backs, providing a most entertaining spectacle.

The raccoons too are most cordially welcomed by groups of sleepy monkeys; they are used as hot-water bottles. All monkeys, excepting the anthropoid apes, which lie down to sleep, are accustomed to sleep sitting together in groups. Only as an exception, and then only in the daytime, will they sometimes stretch themselves out in the sun and indulge in long and happy day-dreams. At night, when they really go to sleep, the need of warmth compels them to sit together, while anthropoid apes, in freedom as in captivity, commonly cover themselves up when going to sleep: in the free

state, in their nests, with twigs, and in captivity with blankets.

A newly-introduced raccoon once nearly cost Fritz his overlordship. A bite on Fritz's left foot reduced him to a limping invalid, and at once procured for the raccoon a respectable position in society. The final upshot was a *modus vivendi* which was observed by both.

When Fritz was wounded, the above-mentioned capuchin, the next strongest male, at once assumed the leadership. It was a palace revolution in miniature! This young monkey, who was originally dedicated to an artistic career, which was brought to a premature close on account of his biting propensity, would have given Fritz a very bad time had not the community taken the part of its fallen leader. Such an action is exceptional in a simian community, and is not always to be observed among their human relations. The monkeys held aloof and temporized and did their best not to fall out with the rising star. "The king is dead, long live the king!" The old relations were restored only by the forcible intervention of the keeper and the healing of Fritz's wound. Fritz repaid his keeper by a loyal affection and support. He would set upon other monkeys at the word of command, like a dog. He always greeted his keeper, and took leave of him, with a handshake.

One day a curious thing occurred. Some new monkeys had arrived, and the keeper, before releasing them, had to remove their metal collars; on which, of course, they shrieked with terror. Having released them, he approached them in the cage as they clung timidly to the

top of the trellis, in order to offer them some bread-and-butter. He was not thinking of Fritz, and was paying no attention to him, when the capuchin suddenly flew at his head and gave him a severe bite on the jaw. The keeper was unable to free himself until a colleague came to his assistance. The motive of this attack was not quite clear. Was it jealousy? Was it anger because the keeper, in Fritz's opinion, had been tormenting the new arrivals when they shrieked so loudly? In that case the attack would have been due to a sort of sense of duty, which would make Fritz feel that it was incumbent on him to protect the other monkeys. At all events, it was apparently due to a sudden outburst of temper, for shortly afterward Fritz, as usual, was offering the keeper his hand. Even the cutting down of his eye-teeth, which was undertaken by the keeper, failed again to disturb the old confidential relations between man and monkey.

In their relations to sick or feeble comrades, and to newcomers, nearly all monkeys—there are very few exceptions—show a very bad side of their character. Compassion is rare. An exhibition of spite toward strangers newly introduced into the troop is indeed intelligible and excusable, but the tormenting of sick and failing members of their own community is revolting. In a state of freedom, doubtless, animals are instinctively acting rightly in expelling a sick beast from the herd, or in killing it; but in captivity, where the sick animal has no enemies outside its own community—whereas in the wild state beasts or birds of prey would quickly put an end to its sufferings—this persistent persecution im-

presses the observer most unpleasantly. Even the few crumbs which the miserable victim contrives to pick up are stolen from his very cheek-pouches, and the cowering, defenseless creature is bitten, his hair is tweaked and his tail pulled, and he is trampled underfoot and jumped on. The spectacle is all the more pitiful and distressing in that the sicker a monkey grows, the more gentle and confiding and human it becomes.

On the other hand, the monkey's love for its own young is proverbial, and beautiful to see. The mother monkey does not know the meaning of danger where her child is concerned, and will even oppose the leader of the troop himself should he ever treat the little thing untenderly. As a rule, it is the mother herself who brings up the child, and it is a mistake to suppose that she spoils it; should it persist, for example, in trying to run away, or in eating solid food before it is ready for it, she will frequently box its ears. In Rome I often watched a mother rhesus who used to carry her child up a tree, and then descend, leaving him there and waiting for him to come down to her. The youngster dared not make the descent, and cried with fear until the mother fetched him down. This went on for weeks, until the little fellow found the courage to descend by himself. In the beginning, too, he would often climb up the tree of his own accord, and then look down and anxiously call to his mother until she fetched him down.

Monkey children play an important part in the troop. All are anxious to avoid any dispute with the jealous and watchful mother. When the youngsters

have grown a little older and more independent, it is reckoned a great honor to play with them, and one that is highly valued. Everything is permitted the little darlings, and even the overlord of all the monkeys will put up with any sort of behavior from them, in the happy belief that they are all his children.

But on the whole, self-seeking, hatred, malice, and cruelty prevail. Nature, after all, is cruel. Think of the degraded cannibal races who kill and eat the old people of their own tribe! Life in captivity, with all its disadvantages, cannot be conducive to either the mental or the bodily welfare of the animals. Jealousy and grudging envy reach monstrous proportions. After all, in captivity the monkeys know nothing of the constant danger, the struggle with carnivorous foes, which in the wild state compel them to closer union. Their food is given to them; they do not need to seek it for themselves. Meal-times are for the monkeys the golden moments of the day. A positively infernal uproar is heard when the keeper appears, and the whole community is seized with an ecstasy of delight. All play together, embrace one another with smiling faces and open mouths, and utter cries of joy. At such moments even enemies forget what divided them.

But as soon as feeding actually begins the scene is suddenly transformed. A stark realism again prevails. With both hands and feet, as well as with the mouth, they seize potatoes, onions, carrots, lumps of rice, or whatever other delicacy is available, and anxious mothers may be seen hobbling off, endeavoring to stow their prize away in safety—that is, in their cheek-

pouches, which begin to swell like tumors. But they are not always successful; a leap, a shriek, and the search for food has to be repeated. What the robber has not taken the victim has dropped in her anguished flight, and other hungry mouths have seen to it that nothing escaped.

Well-fed monkeys waste an incredible amount of food. They smell every bit of it, bite off a little, and throw the rest away. It may always be observed, when monkeys are eating, that they first smell their food. The monkey's sense of smell, therefore, cannot be so imperfect as the popular theory would make it, which divides the animal world into "seeing" and "smelling" animals. The theory does not hold good of monkeys, which are supposed to be "seeing" animals. Nature rebels against easy definitions.

Many amusing scenes occur at feeding-time, as when a baboon (the baboons are all great eaters) literally fills himself to the throat and can absolutely do no more; or when a little monkey, holding a bone twice his own size, ensconces himself in a tree and, thoughtfully gazing through the bone like an astronomer at his telescope, extracts the marrow with a practised forefinger.

In the midst of all this hurly-burly Fritz the chieftain would sit enthroned, assuaging his hunger with tranquil dignity; continually extending a decorous hand to his keeper for another tit-bit. It is a remarkable fact that Fritz never employed force at mealtimes, but would often allow the tastiest mouthfuls to be carried off from under his nose. Two youngsters of

his own family in particular, the illegitimate offspring of the lady rhesus, were always on the watch to steal from the old gentleman; snatching perhaps a potato which his own hands had carefully cleaned. They would even jump on their worthy father's head from behind and deprive him of the delicacy which he thought was on the way to his own stomach. They would often checkmate him in this manner for quite a while; eating was impossible; it was all he could do to retain what he held. Very rarely he would suddenly lose his temper—and recover it as quickly; it was no joke to pursue such active jumpers, and he was by no means anxious to fall foul of their mamma. And, lastly, he was a lover of peace and quiet.

In general, one day is much like another. Such joyful events as births mostly occur in the night or the early morning. The excitement prevailing throughout the monkey-house shows what has happened overnight; the entire population takes an interest in the event. All try to get a look into the cage concerned, and, clinging to the bars in their efforts to do so, often achieve the most extraordinary contortions. In the mother's cage, however, there are often terrible battles. Once, in the time of Fritz's predecessor, on the morning after a birth, nearly all the male monkeys were found to be badly bitten; the troop was broken up in consequence.

Such mournful events as the death of a companion make a much less profound impression, even though the monkeys will gaze at their dead comrade with interest, and often with a shrinking timidity, and will

even move the body. To the animals death seems to be something utterly mysterious, enigmatical, and incomprehensible.

In the morning, after a quiet night—or more rarely a stormy one—the troop awakens, early or late, according to the time of year. The closely-huddled groups of squatting, slumbering monkeys dissolve. They proceed to search for the remnants of yesterday's food or devote themselves to the mutual performance of the morning toilet. In this connection it should be noted that the monkeys are *not* hunting for fleas, since healthy monkeys are never, or only very rarely, afflicted with these tormentors. The toilet consists rather in a combing-out of the fur; and what the monkeys are continually searching for and eating is the crystallized secretions of the skin, whose salty flavor tickles their palates. So long as monkeys are able to bathe frequently, as in the Roman monkey paradise, it will be found that they very rarely indulge in these so-called flea-hunts.

Then meal follows meal, and in the intervals the usual wrangling and jangling occur. Arising out of no real cause, but from mere tedium, and apparently indeed out of a sheer delight in inflicting pain, a sort of sadism makes its appearance.

In the case of many of the large and brutal males a radical dental operation is necessary: the resection at the level of the incisors of the four long eyeteeth, whose inner edges are sharp as knives, in order to protect the other monkeys from dangerous wounds.

As a general thing Fritz insisted on good form,

quiet, and order. An energetic shaking of the trellis of the cage, or the tree-perches, usually produced a very sobering effect on heated tempers. He liked now and then to play with one or another of his subjects. It was a great honor for the individuals thus distinguished, but in the midst of all their merriment they were always careful to handle the mighty one as though he had been an unboiled egg. It is not every one who knows how to move in high society!

All would leap aside to make way for Fritz, baring their teeth in sign of their loyal devotion, and even the most peaceful group of squatting monkeys would break up as though struck by lightning on the mighty one's approach. But they promptly gathered together again if his bearing showed that he meant to honor the company with his presence, and greeted him with jubilant voices, in every key, while he, with his posterior, cleared the best place for himself.

Such is the picture presented by monkeys in captivity—on the whole none too cheerful, but full of gloomy shadows. Yet monkeys are always delightful to watch; it is an occupation that will absorb one for hours, particularly when the animals are as far as possible left undisturbed to their own devices. It is unjust to call the monkey a caricature of man, and his character repulsive. People will say that monkeys are "so horribly human." But the simian character is extremely attractive, even when modified by the unfavorable influence of captivity, precisely because it *is* so terribly human. For what did Heine say? "From the noble pattern of man He created the interesting monkey!"

MORE ABOUT MONKEYS

WHEN I think of all the monkeys I have known, how many appear before me! What a variety of types! There is Brokmar, for many years the tyrant of the Hanover troop of monkeys—a mixture of laziness and cruelty. When he had bitten and mishandled another monkey, he was very fond of dragging it across the cage by its tail! Then there is Brokmar's successor, Tom, a much milder character, the protector of little monkeys, to whom he was almost like a mother. There is Jeko, an expert in snatching and appropriating hats; and Heinrich, known as the bathing-master, whose favorite jest it was to sit on the brink of the drinking-trough and push into the water some unsuspecting monkey who had just lowered his head to drink.

I see, too, Bertram, whom I knew when quite a little boy: a big pig-faced monkey, who was deposed from his post as ruler and sent into solitary confinement because he had the pleasant habit of allowing no one else to eat; for even though his own appetite was satisfied, he would scrape the food into a heap and sit on it! To human beings, on the other hand, he was all amiability and always greeted his acquaintances in the manner typical of the baboon—by the protrusion of the lips into a sort of snout and the lifting of the eyebrows, followed pres-

A MONKEYS' PARADISE
Villa Pace and the bathing-pool

ently by the exhibition of the posterior while grasping one thigh with his hand.

I have already told you of Antonio the Roman Don Juan. A contrast to him was a big mangabey, Babu, who was extremely jealous, violent, and ill-tempered. Once, reaching through the bars, he ripped up a keeper's trousers and tore them off, so that the keeper had to make an unobtrusive but hurried exit, carrying the remains of his trousers over his arm! On another occasion, just before the opening of the Roman Zoo, while Babu was still in a traveling-cage, which was standing on the ground, a very exalted personage paid us a visit. The monkeys were duly inspected, but Babu, whose cage was a little apart from the rest, did not receive much attention. Before he could be stopped, or warning given of his intention, he had boldly grasped and torn off an intimate garment of a little girl who was standing too near him. He seemed to take no little pride in his feat, but loudly scolded the person he had robbed! Fortunately the incident, which was a matter only of seconds, greatly amused everybody, including the exalted personage!

A true original was Mascalzone (Scamp), an old hamadryas baboon, one of whose eyes had been put out by a brutal sailor; but he was still able to grumble and scold about everything he saw, just as well as any two-eyed baboon; for a true baboon is always cross about everything. Mascalzone had already a history; he had been employed at a bacteriological station in Eritrea, and there, as an old acquaintance of his informed me, he used, when given an injection, to acknowledge it by

a military salute. He did not really deserve his name. Although choleric, he was a good fellow, never treacherous, and would offer his hand and rejoice whenever one went to see him.

With the monkeys in the next cage, whom he could see through the intervening bars, Mascalzone lived in a state of continual warfare. One could hear his cries almost all day long. The hay and sand would fly about the cage, and now and again his worldly-wise wife would bear the brunt of his anger. At such times Teresa would bow her head and sham dead until the storm was over. But he never really hurt her. At meal-times he would sometimes seize her by the neck with one hand and with the other would open her mouth and look into it, but he never took anything from her. Teresa, though meekly complaining, would accommodate herself to his humor.

Teresa too had a varied past behind her; she had once been a circus performer. She had first and last many successive husbands; and in course of time developed a regular system of handling strong though not silent men; her last two husbands she completely mastered.

Mascalzone's death was tragic. During a violent thunderstorm a very loud thunderclap frightened the warlike Mascalzone so that he fell dead from the top of the cage. Healthy and lively as he was, he had died of fright.

An original character was Nelma, a hamadryas baboon; she too had been a circus performer before she came to lead a quieter life in Rome. Turning somer-

saults was one of her tricks. It is worth recording that when her mistress brought her to the Zoo in 1911 she immediately forsook her and clasped my legs and began a friendly chat with me. She seemed uneasy at the look of her future companions, who of course were all inquisitively staring at the newcomer. On a subsequent occasion she obstinately refused to recognize her mistress. It is of course impossible that she did not recognize her; such behavior was due to conscious lack of esteem. Antonio and various other monkeys behaved in the same way when their former master came to see them. Such behavior is of the nature of a reproach to the former owner for having given his pet away: now the animal, in return, will have nothing to say to his undependable master! We know how dogs, in particular, will very readily feel a slight, and how plainly they contrive to show their feeling.

Hamadryas baboons, Java monkeys, meercats, and capuchins all behaved in the same way to their former masters, while they always recognized and joyfully greeted other persons to whom they took a liking, even after an interval of years.

A curious observation made years ago in Cologne, in connection with a troop of hamadryas baboons, must not go unrecorded. Toward evening these animals used always to form a procession, headed by their chieftain, who was followed by the elder males, then by the females with their young, and then by the younger males and females, the rear being closed by an old male. In this fashion they made several circuits of their cage, to the sound of a kind of song of rejoicing, led by the

chieftain, the troop joining in. The macaque who used to live with the troop never took part in their ceremonies. One is involuntarily reminded of the baboons praying to the sun as represented in the sculptures of those keen observers, the ancient Egyptians. And these baboons are the maned variety, which was certainly once found in Egypt, though it afterward vanished from the land. The zone of distribution of these as of other animals—for example, the lion, leopard, cheetah, and ostrich—is now interrupted, between Africa and Arabia, by the Egyptian oasis.

Many animals exhibit some psychic abnormality. Years ago there lived in Hanover a rhesus and an ursine macaque which used to bite themselves until the blood flowed. The rhesus was the worst in this respect, and people who tried to tease him or wanted to give him food were completely ignored by Willie, as they were by his much weaker cage-mate, Jenny, a red-faced macaque, who would, however, rage at the sight of children. Willie was thickset and fat; Jenny was thin. Sometimes Willie, for no apparent reason, would spring at the trellis and shake it. The ursine macaque was somewhat saner in his behavior, did not bite himself so severely, was good-tempered with the public, and accepted food when offered. Another peculiar creature was a red-buttocked meercat, by name Rosina, in the Roman Zoo. She cherished a bitter hatred of her own, the so-called tender sex. She would allow men to caress her, and with them was tame and docile, but the sight of a woman, or even of a little girl, always enraged her beyond measure. One afternoon a man and his wife

were standing before her cage. The excited Rosina contrived—how she did it remains a mystery—to force her way out through the bars of her cage, fly at the lady, and tear her dust-cloak. When her keeper ran up she quietly allowed him to take her in his arms and return her to the cage, still scolding the lady.

I have already spoken of the behavior of a large brown baboon in respect of his mate, whose death he seemed quite unable to comprehend. I have repeatedly noted similar behavior in monkeys in respect of their young which have died soon after birth. I have often seen female rhesus monkeys carry their dead babies in their arms for days, searching through their fur and pressing them to their breasts. Very often too they would wash their faces. The immobility of the tiny creatures must of course have made them very uneasy; but the poor mothers had no conception of its cause.

As a rule, all attempts to drive them away from their tiny dead were fruitless. Sometimes, if the keeper came up quietly and frightened the mother suddenly, she would in the first moment of alarm leave the little corpse on the floor; but this expedient was successful only if the keeper was very nimble and fearless, for it sometimes happened that the whole troop turned on him when he touched the little body. Otherwise the mother would not desert the body for days, but when at last its putrefaction had become only too obvious she would cease to take any further notice of it.

A particularly tragi-comical case occurred in a company of brown baboons, consisting of three males and two females. One of them—Niobe—one day gave birth

to a living baby. The previous year she had brought forth a dead one, and this had been taken from her without any difficulty. At the birth of this second child the rejoicing was general. Even the big collared-bear, Teetjen, who shared the cage with Orfeo (as the strongest male was called) and his followers, regarded the tiny black creature with benevolent curiosity. (A great many monkeys have black fur at birth, among them the baboons, macaques, and meercats, while the young of the black Guereza monkey are white at birth.) However, the baboons preferred to keep to themselves, and gathered round the young mother. She would frequently rise on her feet and hold the youngster proudly in the air, just as a young human mother will often do; whereupon the four other baboons broke into a jubilant chorus. They idolized the little creature to such a degree that by the end of two days they had caressed it to death. They all wanted to get possession of it, and the young mother was too vain and too inexperienced to prevent this injudicious handling. After its death she continued for some days to carry it about. Then the tiny corpse was passed from hand to hand; but there was no question of giving it up. Only several days later was it possible to get hold of it, by which time it rather resembled a bit of wash-leather and could hardly be recognized for what it was.

I have already spoken of the dread with which the monkeys regard the draw-net or bag which the keepers use for catching them. At the sight of the keepers' bag all their native impudence forsakes them and they flee. It is worth noting that the mere word *cuccia* (denoting

the bag in question) is enough to put them to flight.

Orfeo is a good fellow and in his way courteous. He never lets me pass his cage without springing on the "climbing-tree" and shaking a branch in greeting. If the family has already withdrawn for the night, I have only to call Orfeo, and at once he comes into the outer cage, shakes a branch in greeting, and disappears. But he will not allow any closer approach; if I attempt it he throws sand in my face. Nelma will do the same if her keeper is present, or if she fancies that she may offend the males of her company by conversing with me; while on other occasions she pays me her compliments and offers her hand in the friendliest way.

Those who do not know and understand animals will call such conduct treacherous. It is not so; it is a matter of simian policy, of self-preservation; it is naturally of more importance to her to retain the friendship of her keeper and the favor of her menfolk than to make a friend of me. A monkey always reasons as a monkey.

It may be imagined that there is no lack of amusing incidents in the monkey-houses. To begin with, there are the various attempts to escape. Apes have a wonderful capacity for perceiving the right moment for such attempts. A little inattentiveness on the keeper's part, a failure to close the trellis or lock the cage door, and the monkey is outside. As a rule the results are not serious, for monkeys, in particular, will always quickly return to the "fleshpots of Egypt"—as the rhesus monkey did on the opening day of the Roman monkey paradise. Only one ran away; he did a good deal of damage to a skittle-board used by some German gentle-

men, and eventually entered the private possession of a Swedish lady, so I refrained from claiming him as our property. On another occasion a young hamadryas escaped from his cage in the monkey-house. (His name was Apollo; for his keeper liked to give his baboons mythological names: Orfeo, Niobe, Apollo!) The keeper made all haste to close the doors and fetch the draw-net. However, he forgot the window at the back of the monkey-house, which was closed but unprotected by netting. He had scarcely opened the door, when he heard the chink of glass, something brown flew through the window into the bushes, and next moment the tip of a brown tail was seen disappearing into the foliage of an oak-tree. Apollo's cage-mates were now shut indoors and the door of the open-air cage was left open. By the next meal-time Apollo was again under lock and key. Apart from a few scratches, he was unhurt; the window had the worst of the encounter.

A rhesus which had been badly treated in the monkey paradise took a great flying leap from one of the tall pine-trees into a mulberry-tree that grew beside the inhospitable island. For weeks he wandered about in the cattle enclosure, eating and sleeping with zebras and bison. His favorite perch was the top of a thatched roof. One day he found the keeper's jacket and emptied the pockets, scattering his matches and breaking his pipe; and this was not his only piece of mischief. He was eventually caught in a trap and placed by himself in one of the corner cages. But he was scarcely put into it when he was loose again. Here was a mystery! The solution was this: the space between the last bar of the

grille and the wall was a little wider than the space between the bars themselves. We had not hitherto noticed this; but the delinquent had seen it at once, apparently before he was taken out of the trap, and quick as lightning had profited by his knowledge. The whole affair was most surprising and comical. After playing truant for some while longer the vagabond condescended to return to the monkey paradise, jumping down from the wall of the moat; and there a warm reception awaited him. His comrades gave him the drubbing he deserved.

Surgical intervention meets with a curious reception from monkeys, and with very little approval. For example, a macaque had the upper lip completely bitten through. The wounded monkey was captured, the tongue continually popping in and out, like a snake, through the split in the lip, and five stitches of sterilized silk was carefully inserted. But the wound did not remain closed very long. For what the patient himself did not do his comrades attended to. With the painful solicitude peculiar to monkeys they untied the knots and removed the stitches, and Heinrich—the "bathing-master," for he was the patient—rejoiced once more in his honorable wound. Even so, it healed.

On another occasion a capuchin broke a thigh. After many attempts a splint was applied which remained in place, but when it was removed it was seen that the bone had set crooked; the foot was now at right angles to the body! Nevertheless, the monkey was able to walk, run, and jump and enjoy life for many years longer.

One may very easily be mistaken as to the motive of an animal's behavior. This is shown by an amusing instance in connection with our old friend Gretchen. She had wounded herself, apparently, by sitting on a nail which was projecting from her climbing-tree. Since the wound was festering, and Gretchen could not comfortably sit down, it had to be treated, which was done with the assistance of the keeper.

One day, when the veterinary surgeon came to attend to Gretchen, he was accompanied by a member of the administrative board whom Gretchen knew very well, and to whom she was much attached. When they entered the cage Gretchen placed herself on her sleeping-box with her head on the box and her hind-quarters in the air; a convenient attitude which enabled the surgeon to examine the wound with ease. While he did so Gretchen gazed at him between her legs. Both gentlemen afterward spoke with enthusiasm of Greti's intelligence; of her own free will she showed the surgeon her wound, and knew that he was doing her good! Unfortunately, they were out in their reckoning; it was only Gretchen's way of making love to the doctor! In the words of the poet:

> Though to herself all unconfessed,
> Her bosom was with love oppressed!

Dietetic treatment is not only more successful than surgical intervention, it is much more appreciated by the patients. In all sorts of stomach troubles, chills, etc., a good drink of mulled wine has always a good effect,

whether in chimpanzees, orangs, baboons, or the smaller monkeys. If the patient leaves any unconsumed it provides a treat for his healthy comrades; for all monkeys are only too prone to tippling. I once saw a young sphinx baboon cutting the maddest capers; he had eaten a quarter of a pound of brandied pralines! On the following day he was very sorry for himself. A large baboon who had severe intestinal catarrh and was greatly debilitated was given a good draught of mulled wine—more than enough for a strong man—while a cholera-belt was correctly applied to his body. On the following day he was as though new-born. The cholera-belt he removed with his own hands.

When a monkey is afflicted with incurable disease it is best to put an end to its sufferings by means of chloroform. I once employed chloroform to kill a tuberculous brown baboon, an adult, and all was over in a few minutes. The animal was placed in a small cage, and a swab of cotton-wool soaked in chloroform and tied to a stick was held in front of his nose. Scarcely a minute passed before it was possible to handle him with safety and to place his head in a jug containing cotton-wool steeped in chloroform. He offered no further resistance and in a few minutes had painlessly fallen asleep. To morphia, on the other hand, monkeys seem to be constitutionally much more refractory. A young maned baboon who was paralyzed was actually given fifteen grains in one dose without showing the slightest reaction, though this was more than three times the maximum dose for a human being. He did not even become sleepy; it was necessary to resort to chloroform,

of which a very little sufficed. But merely to stupefy the larger cats, such as lions and tigers, requires an incredibly large dose.

To put an animal to death in this way is always painful to one who loves his beasts, but it is only too often necessary in order to check the further spread of an infectious disease, or to shorten the sufferings of an incurably afflicted animal. It is then an act of true humanity, of Samaritan kindness, which we owe to our beloved animals.

PART II

LIONS IN CAPTIVITY

THE term "beast of prey" evokes a queer, uneasy feeling in the average human breast. Involuntarily one thinks of the beasts of prey as bloodthirsty, malignant creatures. Yet the prejudice is largely unjustified. It is quite unjust to regard all those magnificent creatures which belong to the great order of the carnivora merely as eternally bloodthirsty murderers which kill for the sake of killing.

For the carnivora, great and small, do not kill for the sake of killing. They kill only in order to live, obeying the instinct of self-preservation, and fulfilling the life-purpose which wise Mother Nature has assigned to them. Their task in Nature's household is a very important one: it is the extirpation of the weak, those which are not capable or worthy of existence, and the limitation of the individual members of other orders, families, and species of animals whose excessive multiplication would otherwise disturb the equilibrium of the wild life of the world. To maintain this equilibrium by the destruction of the weak and incompetent, and by the limitation of numbers, is the life-purpose of the beasts of prey.

We should remember this before we seek to compass their extinction by powder and lead, or by the uglier means of trap and poison. Where foxes, weasels, owls, and buzzards no longer exist hamsters and field-mice increase and do a hundredfold more damage than any

of these creatures of prey, even if they do occasionally devour a hare or a partridge. It is to be hoped that they will never be extirpated; it would be a pity merely from the aesthetic point of view, to say nothing of the economic consequences of their annihilation.

With very few exceptions carnivorous animals are sensitive creatures and mentally highly developed. Their manner of life demands intelligence and high sensibility. The beast of prey must seek its prey, outwit it, and overcome it. Its food does not come to it. Its life is a perpetual struggle.

In captivity there is no such effort; the animal has no need to seek its living; the struggle for life does not exist. In many species this leads to the mitigation or even the disappearance of their natural savagery, and also, if you will, to a kind of psychic degeneration. The great cats readily become attached to human beings, and will even exhibit the greatest fidelity. Mankind, on the other hand, is accustomed to regard those truly kingly beasts, the lions and tigers, with a pious awe: very unlike his feeling for the monkeys, which to him are so "terribly human." With their keepers in particular the big cats easily enter into familiar and confidential relations, partly because the need of attaching themselves to men is peculiarly characteristic of these animals, and partly because the keeper, having to deal with a smaller number of charges, is able to devote more time to individual animals. Lions, tigers, panthers, and leopards all become tame. The jaguar is not so readily tamed.

The mental capacity of the large cats is assuredly

THE LIONS' GROTTO

not to be despised, even though inferior to that of the bears and the dog-like carnivora.

As a rule, only young specimens are sent to us. Older animals, if caught, seldom overcome their longing for freedom, and most of them die after a few days of captivity. Moreover, in their case the difficulties of transport—for example, from the interior of Africa—would be excessive.

Sometimes foreign rulers present us with young animals. For instance, the Roman Zoo possessed a pair of young lions which the Negus of Abyssinia presented to the King of Italy. The difference of character in these two animals was remarkable. While the lion, Lenkju, was very good-tempered, so that one could even go into his cage, the lioness, Lemble, was incredibly vicious, would not allow herself to be touched, and would attack her companions, two lions and three lionesses, if they entered her den, which was contrived in accordance with Hagenbeck's system, in a moated enclosure without bars. One could quite safely go in among the other four beasts—for example, to photograph them. One of the lionesses, Lisa by name, would often approach one with playful intentions, but her play would, of course, have seemed a little rough. She once allowed herself to be photographed sitting on top of Eritrea, another lioness, who was presented by the Governor of Eritrea. Beside them stood Giorgio, one of the lions, about three years of age.

All these animals greeted persons of their acquaintance with the remarkable mewing tones which seem so out of place in full-grown lions.

It was extremely interesting to observe the mutual relations of these five great cats. As a general thing, lions in zoological gardens are kept singly or in pairs only, owing to considerations of space. In the Roman Zoo the method of placing them in a large open den or grotto makes it possible to keep a larger number together, and this is in accordance with the habits of the lion in the wild state, for where lions are abundant they live and hunt in packs and are extremely gregarious by nature. Schillings, the explorer, once saw a group of fourteen lions.

Just as among the monkeys, so here the strongest of the five lions, Lenkju, placed himself at the head of affairs. Giorgio willingly gave way to him. Giorgio was a good fellow, but not very clever, and he had the regular "menagerie face," with knitted eyebrows and protruding tongue; one could tell that he had been captured when quite young, or possibly born in captivity, although he was imported from Abyssinia. He may, however, have come from some menagerie there. Unlike Lenkju, who had a dark mane on neck and breast, he had only a sparse light-colored mane on the neck; which shows that in Abyssinia there are at least two varieties of lion. He had never realized why there should be two sexes in the world, although Eritrea made him the most affectionate advances. They had already lived together for a year before the Zoo was opened and before the other lions arrived, and so had remained faithful to one another; but Eritrea's real husband was Lenkju.

An element of discord was Lemble, on the whole an unpleasant character. Like Thersites, the baboon, an-

other professional informer and trouble-maker, she had a striking congenital defect, one of her forelegs being too short, so that at first sight she seemed to be rheumatic or suffering from an injury. How often physical defects go together with defects of character! Lemble used often to quarrel with the other lionesses. When this happened the gravel would fly, and both combatants would frequently end up in the moat. She cherished a particular hatred for the good-natured Lisa.

When I returned to Rome I found my old friends had gone. In their place were Sultan, an imported lion, and three lionesses. Sultan is a good fellow, but inclined to be surly when in love. He likes to show off before the lady of his temporary choice, and is very jealous. His keeper, at such times, will pull laughingly at his forelock, and Sultan never thinks of trying to bite him. Very surprising was his behavior when required one day to collaborate with a cinematographer. He was put into a special cage and was required to leap angrily at the door. He did this twice, but when he was expected to repeat the comedy he lay down in a corner and contemptuously turned his back on us, and for some days afterward he deliberately ignored both the keeper and myself. If approached in his den he would no more think of attacking than Lenkju would have done; which is more than could be said of his mate, Julia, who was more like Lemble.

The eldest of his harem, Ida, first saw the light many years ago in the Nouma Haxa menagerie, and bore in her head, face, and limbs all the signs of the menagerie lion. At one time she took part in an exhibition

of "lion taming," leaping madly to and fro in her cage and finally, when the tamer left the cage, hurling herself against the door. She was presented to the marveling public as "a lioness caught only two months ago in the African desert. Despite her fierceness, she is already performing." Even in her old age Ida is still an actress. If approached she snaps in the air and makes a terrible sweep with her paw; but she has never done any one any harm. Once, on a holiday, when a small military band came marching through the gardens, playing a regular tin-can-and-whistle march, Ida showed signs of restlessness. The music reminded her of the menagerie, where music was the prelude to each performance. After long years of the contemplative life, the memories of her public career rose again into Ida's mind.

In a certain troupe of performing lions one of the beasts, August, used to walk on a rolling cylinder, but one day he resolutely refused to do so and could no longer be induced to mount it. Another lion was taught to perform on it. Then, seven months later, August came forward one evening, pushed his successor aside, and went through the usual performance.

Ida repeatedly gave birth to cubs. Three of them used to live together with two cubs by another lioness. All three of Ida's cubs had defective sight, and one was blind. (The poor little thing had eventually to be killed.) It used often to lie in the outer cage and had to be fed by hand. One day the four other cubs were in the further of the two indoor cages, while the blind one was lying in the first of these cages. The sliding door was opened, in order to make the cubs free of both

SUNDA TIGER
Ercole

cages, the innermost of which contained their straw bedding. Then a curious thing happened. The blind cub's sisters gripped her carefully by the tail and drew her out of the first cage into the second and on to the straw bedding; they then drove the other two cubs into the first cage, and would not allow them to come near the invalid. A striking instance of family feeling; which is shown also by the fact that young animals will respond only to the call of their own dam, even though they cannot see her.

In 1922 we were given a lion, about twenty months of age, which went by the name of Faff. Both he and Dilli, his cage-mate, were tame, and nowadays he is even reluctant to allow us to leave his cage when we visit him; he stations himself at the door and throws himself down on his back, like a dog.

I have often visited lions in their cages, but have never been seriously attacked. A stool is a good weapon of defense; a crack on the head from this will bring the animal to its senses. Or one may surrender the stool, on which the beast may wreak its rage, and incontinently take one's leave.

Lions will become very tame if treated as household pets. The Countess Montgelas had a lioness, Cleo, which was a member of her household for more than three years. Some years ago, too, we sold a young lioness to the mayor of a small North Italian city. Not long ago he came to see me and gave me a photograph of his lioness, quite at liberty in his garden. He told me how it delighted him to see her wander about at liberty, and follow him like a dog when he went out shooting.

A few words as to a widespread superstition: that one should avoid giving young animals raw meat, in order not to awaken their "innate savagery." This, of course, is nonsense. The digestive apparatus of the carnivore requires meat, and raw meat. Cooked meat will be accepted for a time, but then the beast falls into a decline and dies. It cannot digest cellulose. Its "innate savagery" is by no means general. All depends on the disposition of the animal, its treatment, and its experience of life. If all these are good, animals will always be tame, provided they are allowed to feed undisturbed, and treated with precaution in the mating season—that is, about the month of May.

The hours of play are in the early morning and late afternoon, shortly before feeding-time. It is then a fine sight to see the beasts running and leaping about in the wide space allotted to them, and romping together like kittens. At other times of the day lions are extremely lazy, and many visitors to the Zoo resent paying good money only to find that the king of all the beasts refuses to vouchsafe them a glance, or even to show himself.

At feeding-time things are always pretty lively in the lion's den. But whereas monkeys, before feeding, rejoice together in a spirit of universal brotherhood, and embrace one another, only to quarrel all the more bitterly when the food is before them, the converse obtains of the great cats. There is wrangling before the meal and while their meat is being given to them, but when each has obtained his portion all is peace; each is concerned exclusively with his own affairs. The persistence with which the cats will stick to the place they have once

and for all chosen often entails inconvenience to the animal itself. In one zoological garden, for example, a lion used always to lie with his head against the bars, and although he was in other respects a phlegmatic beast, he would snarl at any one who looked at him, and by so doing incited the more senseless of the sight-seers to tease him or blow smoke in his face, in order still further to enrage him. He would then gulp down his jealously guarded meat with undue haste, with the result that it almost invariably came up again. He died of a chronic stomach trouble.

Lions, in general, even when bad-tempered—and trained lions are so quite frequently—are frank rather than treacherous. As an example of the degree of tameness which they sometimes attain: some years ago, in Cologne, there was a fine old lion who would let his keeper comb out his mane, and I myself saw him allow the man to extract a piece of bone which had jammed between his teeth and was causing severe bleeding.

Lemble, the Roman lioness, had a trick of dragging into her cage the umbrellas of those who teased her, and would steal soldiers' caps in a perfectly friendly manner. On Sundays (when the price of admission was lowered) nothing was left of many a soldier's cap save the metal star with the regimental number. Many a youthful warrior returned to barracks bareheaded.

One of the lionesses in the Berlin Zoo took a delight in catching sparrows in her outdoor cage. She would strike at them on the wing and bring them down with astonishing dexterity.

The innate indolence of the lion is particularly ap-

parent when the lion-tamer takes him in hand. Above all, he is a poor jumper, unlike the more lively and impulsive lioness. The performance of the slenderer and more active tiger is much more impressive. The tiger is an excellent jumper, and although the lioness is the same, she does not cut much of a figure.

Most tigers will become hand-tame, even sooner than the lion, but they have not his sense of honor. The tiger is less given to snarling, but will strike or even bite more readily. Julia, the great Bengal tigress in the Roman Zoo, would seldom raise her paws, but now and again, if one were stroking her, she would champ her teeth like a horse, and then one had to be on one's guard. She had once been a member of a well-known troupe of performing lions and tigers.

Quite a different character was Ercole—despite her masculine name, a Sunda tigress. She arrived in Rome in the winter of 1911, and it was almost three years before I could induce her to let me touch her. At first I held my closed fist for her to smell, having previously aroused her curiosity by stroking other animals. She approached with uneasy discretion and sniffed with interest at my hand. Then she licked it, while she slowly raised her right paw. A sharp though quietly-spoken rebuke, and the paw sank back. Gradually matters improved so far that Ercole leaned against the bars and allowed me to stroke her. On the other hand, this animal has a frank aversion for all keepers in uniform, even for her own keeper, although he has never done her any harm, being a good keeper and kind to animals, as are many Italians. This dislike must be based on a

first impression received after capture. In other respects she is a good creature, shy and timid, but not treacherous; and if she is rather ready with her paws, this is with a view to defense rather than offense.

One could not say the same of Carlos and Giulia, who were once public performers. They used to attack in earnest, and when I passed their den they always crouched as though ready to spring, and sometimes they did actually leap at me, only of course to land in the moat. They recognized me always, even in the densest crowd, and at once became lively, no matter how indolent they had been before my arrival. The onlookers, of course, knew nothing of the reason of their peculiar behavior; one often heard them declare that the tigers were trying to break loose. I do not know why these animals felt such a cordial aversion for me. Perhaps it was due, as in the chimpanzees, to a sort of jealousy, because I used to give orders to the keepers.

Very different from Ercole, or Carlos and Giulia, was Fanny, though she too could look back on a famous career. She was bought for the purpose of the cinema, and played her part extremely well. She had to leap at a tethered goat, but in front of this was a skilfully hidden pit into which Fanny had to fall. She did this according to program. A net having been previously let down into the pit and secured to four pegs driven into the ground, the fallen tigress—fallen in two senses!—was restored to the light of day. Fanny was not in the least disturbed; she appeared to regard such practical jokes in the most philosophical spirit, as matters of every-day life. Next—again according to program—

she was to have been shot. But this went against the grain with all concerned—the director, the producer, and the whole company of artists; they had all grown too fond of Fanny. She was as tame as a dog; one could put one's arms right into her cage and stroke her, and she was never tired of being stroked, but would purr with contentment. Accordingly a second tiger, a vicious beast, was procured to replace Fanny. It was shot twice, in two different parts of the film—how, is a secret of the cinema!

Fanny, however, was spared for more peaceful scenes. She was no longer quite young; she could no longer deal with bones, but was given only minced meat, and a quart of milk daily. Finally, she came to us in the Zoo. She took her meat from the palm of one's hand; indeed, we could go into the cage and feed her so without any precaution, for she was never angry or in the smallest degree intractable. Her incisors and eye-teeth were still in good condition, but the molars had fallen out. Then one day, without being really ill, Fanny was unable to stand. She died of senile debility. Her handsome skin now adorns my study, a cherished memorial of a brave and loyal tiger-heart.

A delusion which one frequently encounters, and against which new keepers have to be warned, is the idea that one must shout at the larger beasts. Nothing could be a greater mistake. Shouting, striking the bars, and sudden movement are intensely disagreeable to animals, and especially to the large cats, and will frighten and anger them. To the sensitive ear of the animal quiet speech is agreeable; one should shout at

animals only in case of personal danger, and then shouting will not fail of its effect—because the animal is not accustomed to it. Keepers who are always shouting are as useless as teachers who are eternally scolding; both would be better employed in breaking stones. And the management of animals requires a certain pedagogical talent. The trainer has to draw out what is in the animal, just as though he were educating a child.

The large cats are capable of close attachment and will recognize those they love—or hate—even after an interval of years. Years ago, for example, Hans, a tiger in Hanover, was a particular friend of mine. He was as docile and affectionate as a dog, and like a dog he would leap up at the bars for joy when he saw me, purring like a great rattle. On the other hand, he hated an old gentleman who used to tease him by snapping his fingers at him; he would leap at the bars and roar as a tiger roars only when furiously angry. Both Hans and another Bengal tiger would rage at the sight of colored persons. So, too, would Carlos and Giulia when men of the Italian colonial troops—the Eritrean Askari—visited the gardens. Did they recall unpleasant memories, or is the odor of the colored man offensive to the tiger? It is impossible to decide. I have never noted such excitement at the sight of colored people in lions, even though imported.

How far the instincts of the beast of prey had decayed, in the case of Hans, as a result of long captivity and continual intercourse with human beings was demonstrated once when he was rather out of condition. In order to afford him a change of diet, and to bring him

out into the open, a live fowl was placed in his cage.

Did the "bloodthirsty beast" pounce upon the terrified and loudly vocal fowl? No; first of all, Hans sniffed at it; then he took it loosely between his teeth, but immediately released it and drew back, startled. A beast with such remarkable fur and with such a peculiar voice was beyond his comprehension. The worthy hen had to be killed and carefully plucked before Hans would accept it.

It was the same with an elderly gander intended to tempt the invalid. It was taken for granted that his last hour had come when he was turned into Hans's cage. By no means! With outspread wings and a wild battle-cry, the pugnacious gander took the offensive, before Hans had time even to take a look at his new guest, flying at the tiger's face with such violence that the great beast withdrew in alarm to the farthest corner of the cage. He was speechless and powerless in the presence of such a firebrand.

Here I may recall an incident which occurred in the Frankfort Zoo, and at the time was reported in the press. A lion had stretched himself out in comfort after a meal. Beside him lay a relic of his repast in the shape of a horse's shin-bone. A tiny mouse made its appearance and began to gnaw at the bone, running fearlessly over the king of beasts, who gazed at the tiny creature with magnanimous eyes and allowed it quietly to satisfy its hunger. The onlookers, who had gathered in a crowd, gazed at the spectacle in tense amazement.

Then the tiny creature left the cage and jumped down to the ground. In a moment the umbrellas, sticks,

CARLO AND GIULIA IN POSTURE OF ATTACK
Having caught sight of the author on the other side of the moat

and boots of valiant *homosapiens* had put an end to the little mouse's existence.

Which side of the bars were the "beasts"?

This is a good example of the really conspicuous magnanimity of the lion.

The family life of the large cats in captivity is generally happy. Lions, of course, are more often bred than imported. It seems curious to hear of a Cape Town menagerie or the Sultan of Morocco obtaining lions from Hagenbeck! It is a good thing that more lions have been imported during the last thirty years; it was high time to introduce new blood, for the lions of our zoological gardens were becoming too nearly related.

Now and again, however, two animals will conceive an insuperable aversion to one another, and as regards the beasts in our zoological gardens this is always a ground for divorce; and for excellent reason, since otherwise bloodshed and murder might result.

Young lions, as a rule, may be successfully reared either by the mother or with the help of a canine wet-nurse, or even with the feeding-bottle, of which I shall have something to say in another chapter. In the Berlin Zoo, for some years past, young lions have been reared solely by canine foster-mothers, and with the best of results.

It occasionally happens that the mother will not interest herself in her cubs, or will even kill them. A lioness is often unable to give milk: a not unexpected result of the degeneration caused by captivity. Of the three Roman lionesses only one—Lisa—was a good

mother, who reared her cubs faithfully and was never weary of playing with them. It was delightful to watch them at meal-times. The youngsters, angrily growling, would try to drag the meat away from their mother, and she, now and then, would let fly and send the shameless little tyrants tumbling head over heels.

Eritrea was a curious creature. She bore, as a rule, only one cub, and at first was always strikingly affectionate and jealous, so that the cub was usually left with her. But on each such occasion—though sometimes only after a lapse of weeks—her tender care suddenly ended in her seizing the cub by the tail and throwing it into the air! Then it became a question of rescuing the little creature before it was too late. A still worse mother was Lemble, who used to eat her young during the course of their first day, unless they were promptly rescued; and rescue was not easy, since Lemble was vicious by nature.

What is the true cause of this unnatural behavior? Is it due merely to physical and mental degeneration, or to the inexperience of young mothers, or to the lack of the needful quiet, the safe and secret place to which the animal would retire in a state of freedom?

This unnatural and unmaternal behavior has of course been attributed by some to the thirst for blood. But the lions and tigers in the Roman Zoo are given only the still warm flesh of freshly-slaughtered animals which has not been drained of blood. For a change they are given the heads of bullocks, or wild pigs, freshly killed and still warm. In any case such behavior is to us incomprehensible, and we can only say once again,

with the great French entomologist, Fabre: "For us, the inner nature of the animal remains an unfathomable mystery."

At all events, it would be unjust to judge these degenerate mothers by our human standards.

A true family life is as rare in the zoological gardens as it is in the wild state. Here, as there, the happy mother retires into solitude, far from the teeth and claws of her lordly consort, for the lion and tiger, like the buck rabbit, are apt to display cannibalistic tendencies toward their offspring. Accordingly they know nothing of the joys and sorrows of paternity; and of the German poet's profound observation, that it is easy to become a father, but difficult to be one, only the first part is relevant. The only exception known to me hitherto is the splendid Siberian tiger in the Berlin Zoo.

How far the trust and affection of the large cats for their keeper will extend, and how far their intellect may be developed by intercourse with human beings, were shown some years ago by a silver lioness in the Hanover Zoo. When she lay sick after a severe miscarriage she allowed her keeper to go into her cage and gladly accepted his help, although he had never entered her cage before.

The behavior of individual mothers varies greatly. Many are extremely jealous of their young, and are then vicious, though at other times they may be tame; and these are not always the best mothers, as was proved by Eritrea. Others again, like Lisa, will allow strangers to handle their young without anxiety.

What has been said of lions and tigers is true also of leopards. It is more unusual to find a tame jaguar. I have never seen a hand-tame snow-leopard or *Irbis;* they are mostly trapped, and are adult when captured.

We once had a really vicious snow-panther in Rome. This animal—a female—was sent to us in 1914, after the outbreak of the war, by a small Austrian dealer, although we had not ordered it. One morning we were informed by telephone that a wild beast, an *animale feroce,* had arrived for us at the express goods office. I, of course, knew nothing of the matter, but went to the office and there found a locked railway-van, the ill-famed *vagone completo,* in which the animal was supposed to be. It was opened, but none of the railway officials would enter it with me. The animal, they said, was very vicious. As I looked down from above into the very unpractical traveling-cage a big white animal spat in a terrible fashion.

In order to shorten the creature's sufferings I paid some 300 lire for the *vagone completo* and had the beast brought to the gardens. There it was turned into three communicating cages, one of which could be closed in front by a detachable shutter, and served as a sleeping-box. The animal was of course very timid, and spat continually at the very sight of a man. It lay motionless on a shelf and took a long while to get accustomed to human beings. After some weeks it would eat while the keeper or myself, or any other person whom it knew, was standing near the bars. On the other hand, it hardly moved all day, and then only by creeping on its belly, shrinking back again after a few steps for-

A LION WITH HIS KEEPER

ward. It never tried to strike through the bars; its spitting and its occasional leaps forward were due merely to its fear for its personal safety.

It is a curious fact that the large American cats—the puma and the jaguar—like the bears, are very seldom seen in troupes of performing animals; yet the puma is very often seen in captivity, and the jaguar and the black bear not infrequently. The jaguar and American black bear or *Baribal* seem to be distinctly less intelligent than the corresponding Old World species—the panther and collared-bear. The jaguar, with its broad head, short legs, weedy hind-quarters, short tail and rounded back, is, despite its beautiful markings, the most ill-favored of the large cats, and owing to its short hind legs is also a poor jumper.

In conclusion I will record a few little *contretemps* which show, among other things, that the beasts of prey are better than their reputation.

After cleaning out a cage, an assistant keeper forgot to close the door. He had allowed two female leopards, born in the gardens, and about five years of age, to return to their own cage, and had innocently entered the cage just vacated, in order to clean it. A visitor who happened to be in the building saw the two leopards spring quick as lightning from their cage and disappear under the row of cages. He gave the alarm and the building was immediately closed. It remained closed for several days "on account of repairs." But the leopards refused to return to their cage. Several suitably armed keepers entered the building, provided among other things with a large draw-net. One par-

ticularly valiant keeper who was given to quickening his vital spirits with alcohol seized the leopards, one after the other, by the tail and dragged the terrified creatures, who wanted only to escape, back to their cage and threw them in. They had done very little damage. Only the old jaguar had his right forepaw badly bitten. He had certainly "asked for it," and got it with a vengeance; he went lame to the end of his days. The story was that he had jammed his foot in a sliding door, an explanation which satisfied the uninitiated.

Here is another adventure, this time with a lion, in which our head keeper, Angelo, was concerned, at a time when he was traveling about with the Nouma Hava menagerie. An almost full-grown lion in one of the vans had broken down the partition which divided it from a zebra and had fallen upon the zebra, biting it about the shoulders. Angelo, prompt and resolute, sprang into the van, seized the lion by the mane, and bit his ear until the king of the forest released his hold. Before the disconcerted beast could recover his bearings Angelo had hustled him into an adjacent compartment and quickly closed the sliding door—and the zebra was saved. This incident shows what an impression such audacious behavior will make upon even such a formidable beast as a lion, and how uncertain of themselves caged animals may feel, divorced from their accustomed environment.

Now and again some beast of prey breaks loose from a traveling menagerie. As a rule, such an animal is easily recaptured, by means of draw-nets or wheeled

cages. It is seldom necessary to shoot it; though sometimes, as in Leipzig lately, it may attack a horse. But even in this instance the lion could have been retaken alive. The lion hunt undertaken by the police was as a matter of fact unnecessary. If the public would only behave sensibly the truant beasts would do no harm; they are only too thankful to be left alone. I do not know of any case of a beast escaped from captivity having killed a human being.

A tragedy once occurred in a zoological garden. Through the negligence of a keeper a tiger found its way into a leopard's cage. Before any steps could be taken to intervene, a blow from the tiger's paw had stretched the leopard dead. The tiger was uninjured.

It is interesting to watch two of the large cats when they catch sight of one another through holes or chinks in the intervening partition. They crouch on their haunches, like dogs begging, and proceed to work at the partition with their forepaws, the claws being retracted. It is as though they were trying to polish the wall. The paint soon disappears, and the noise of the "polishing" resounds through the house like thunder. All this while the beasts are perfectly silent but are none the less greatly excited. It is the silence before the storm!

This sort of thing is often done by animals mutually acquainted—for example, by mates undergoing a temporary separation—and often, too, its intention is aggressive. A lion and a tiger who were confined in ad-

jacent cages did it for hours at a time, by no means with friendly intentions.

Sometimes this "polishing" is done out of tedium, or, in the evening, at feeding-time, because the animals want to get into the next cage.

A few words as to the taming of lions and tigers. The best description of the process will be found in Karl Hagenbeck's "Von Tieren und Menschen." The most effective animals from the trainer's point of view are the tigers, as they are the cleverest, and also the best jumpers. In both respects they are greatly superior to the lion.

In respect of the performances of trained animals, I should like once more to remark that the public have very little conception of the real dangers incurred by the trainer. When a good-tempered animal, sitting on its pedestal, spits or strikes at its trainer as part of its performance, all the spectators feel a thrill of horror. If a beast fails to jump through the hoop—again in accordance with the trainer's intentions—but succeeds on the second or third attempt, the whole house applauds the trainer. "He made him do it after all!" Yet this is merely the well-known trick, familiar to all jugglers, acrobats, and variety artists, of apparently failing to do a thing the first time in order to earn greater applause on succeeding. But I must not tell tales out of school!

In a large mixed group of trained animals there was a lion who, whenever he was called upon to leave his pedestal and take part in some new formation, used to turn on the trainer, to attack him, in the awkward

and obvious fashion of the lions. The trainer was always prepared for this extra turn, and drove the lion off with stick and whip. In the end, if I remember rightly, he was turned out of the group. I had watched the rehearsals daily, for hours at a time, was well acquainted with all the animals, and knew that the lion was really in earnest. He never jumped, but ran growling forward, striking at the air right and left with his forepaws.

A tiger in the same group used to behave quite differently. She, like our Roman Giulia, tried to bite. She did this whenever the animals, lying in a row, had to go back to their places at the word of command. The trainer used to stand behind the beasts, and they had to pass him in returning to their posts. This tiger tried always to pass close by the trainer and to bite him in the leg. Thanks to his watchfulness she never succeeded. In her cage she was not at all vicious, but liked to be stroked.

This sudden and secret attack, together with a well-bred and upright bearing, is characteristic of the tiger; so that the trainer knows moments of real danger of which the great public has no conception.

Training in the modern circus or menagerie is a very different thing from the old training in traveling-cages, which was in principle, I regret to say, a reprehensible process of cowing the animal by violence. But even today training is not accomplished entirely without compulsion. At first each of the tricks which an animal is made to perform amuses it, as something new, whose accomplishment is rewarded by a piece of

meat. But after a while the meat is no longer forthcoming, and the trick grows rather stale. It is then that compulsion is necessary. In the beginning the beast must show what it can do; now the trainer must show what *he* can do—namely, in compelling the animal to obey him and accomplish its task.

It has often been suggested that the training of lions and tigers is a degradation of these lordly creatures, and a cruel and futile business. There is now no question of cruelty, and without mental alertness and personal courage no one can become a trainer. The trainer's calling demands true manhood, and its fascination is proved by the fact that those who have adopted it out of real inclination never relinquish it, despite its dangers. As for cruelty, many a gun-dog or horse has to endure far more compulsion in the course of its training.

Objection can hardly be made from the aesthetic point of view—though we might perhaps be spared the spectacle of an elephant playing the barrel-organ! But those who have seen the tiger troupes of Sawade or Wagner will remember them and their trainers only with grateful admiration. The same remark holds good of the lion troupes of Claire Heliot, Alfred Schneider, and Siegfried Lichtenthals.

In connection with the Schneider troupe, which is some forty strong, one case deserves special mention. Of the three powerful maned lions in this group the eldest is the eleven-year-old Kapozzi; the others are respectively six and seven years of age. One of them, Czar, is sometimes rather uncertain, and attacks if he

is struck. In such cases Kapozzi used to defend his master against the other two, until they grew too strong for him and one day dethroned him. Like Fritz, the macaque, Kapozzi stood by his master as long as he could.

LIONS AS HOUSEHOLD PETS

IT is not every day that we see a lion as a household pet. To keep lions as one keeps dogs is granted to very few mortals. But in the summer of 1912, when a large batch of animals was sold by the Roman Zoo to Germany, the center of the trade in wild beasts, a lioness who was sold with the rest had to leave her two cubs behind her. Sorry as we were for the mother, we could not avoid the separation. During the journey she was very restless and depressed, even refusing food in her grief at the loss of her cubs; but on the cubs themselves—the little things were then only three weeks old—the separation made no impression. But now a serious problem arose: how were the orphaned cubs to be reared? We could not procure a canine wet-nurse, so it was decided to rear them with the feeding-bottle, and my housekeeper accepted with enthusiasm my suggestion—which was at first made only in jest—that she should be their foster-mother. Accordingly the dear little creatures were for five months inmates of my house.

The business of artificial nourishment was by no means a simple matter. Cow's milk, thinned with water and sweetened with sugar of milk, proved at first unacceptable, as did the cold rubber teat, and for three days my housekeeper was busy with her foster-children from early morning until midnight. The future kings

of the forest lay in a large box with a soft bedding of hay; so far they were scarcely able to crawl about. Only after several days of patient attention and renewed attempts were they reconciled to drinking from the bottle. But once their reluctance was overcome, the bottle had only to make its appearance and they began to push and struggle toward it, each trying to get the first drink. And already the little fellows began to show the ferocious dog-in-the-manger spirit characteristic of the great carnivora. The female always demanded precedence, and if her stronger brother refused to yield it the fur began to fly. To see the little creature spitting with fury was always an irresistibly comical sight.

The change to a meat diet, which was made when the cubs were four weeks old, was at once successful. At first we gave veal or beef, small morsels of which were placed in the mouth, or were licked off the hand. Then horseflesh and ass's flesh were added, and presently soft bones and cartilage were given. Both cubs would without protest allow their foster-mother to take their meat out of their mouths. I myself dared not do this, for as I was not the food-giver I was not so important a person. Even with young carnivora one reaches the heart through the stomach. The female cub, Hexe, even when a yearling lioness, used to give her meat to her keeper at the word of command.

At night my two guests slept in the kitchen, but in the daytime on the balcony. However, this was only for a few days, for they were already becoming able to leave their box and indulge in the instinct which young lions (but never old ones) are so fond of in-

dulging—namely, that of climbing. The balcony railing, though broad, was too dangerous for their first attempts, so they had to bid it farewell. Now the kitchen and a long light entrance-hall became their playground. Their sleeping-place was still in the kitchen. My housekeeper went to her charges early in the morning, and from an early hour one heard the howling, complaining voices of the hungry creatures. They would continually leap up at their foster-mother, trying to claw their way up to her shoulder. But at last their milk was ready, and they would take turns to sit on her lap and drink it there.

Here again the little lioness was the quicker and more violent. It was curious to see her spitting and striking at her brother. Meal-times were not peaceful. Each would try to crowd the other off their foster-mother's lap, and when one of them was thrown off it would promptly climb up again. But if one were put outside the door, it would cry piteously and scratch at the door, while the other refused the bottle.

They were fed every three hours, the last meal being at midnight. The daily ration of milk gradually approached two gallons. After each meal the little rascals romped about the hall, where they were very fond of hiding behind the curtains, or indulged in all sorts of mischief, as my boots and slippers bore witness. They began to jump with ever-increasing agility. No coats or umbrellas were safe in the hall, and tablecloths were out of the question, for the cubs pulled them down off the tables. One day we found the male cub—Dilli—on the kitchen table in the midst of a

heap of crockery; but my housekeeper went quickly up to him and removed him before he had done any damage.

His sister was given the name of Hexe (Witch), but she was a "white witch." We had to be very careful not to leave the doors open, or the cubs would be found on the sofas, arm-chairs, or beds; or, what was worse, the carpet would be regarded as representing the earth, and treated accordingly. Cats, as is well known, like to bury their excrement.

Thus the time came when it was no longer possible to keep Dilli and Hexe in the house all day. Accordingly I had a big temporary run made, with wire netting, in the garden, opposite the kitchen window. A shed with a roof of palm-leaves provided shelter from the sun. In the morning, after their breakfast, they were carried down to this enclosure; for, like puppies, they refused to go down the steps. From this new playground they could not distinguish persons at the kitchen window, which was on the first floor and at a distance of thirty yards or more. Nevertheless, they could recognize their foster-mother's voice, and answered it with plaintive howls. They seemed in particular to be homesick for their old play-room. But time came to the rescue. They were still greatly excited at midday and about tea-time, for they were fed at those hours. Four times a day they were given milk, twice in the house and twice—at the hours named—in their playground. About four o'clock they were given their second ration of meat. One day, at breakfast-time, they both stationed themselves before the door

of my house and waited, quietly and discreetly, until it was opened for them. Thenceforward this happened continually; no sooner did we think them safe in their run than they were up at the house again. In the evening, too, they came as soon as the public left the gardens. How they managed it was not very clear until we saw Dilli, pressing his back against a young hornbeam which grew some ten inches from the wire, clambering up the latter, when, having reached the top, he simply let himself fall over. Before this discovery we had often seen Hexe complaining alone in the enclosure while Dilli was either waiting at my door or lying in the shadow of a bush before the house. He, then, was the inventor of this method of escape, and Hexe gradually learned it from her brother. But what led the little chap to the discovery? Was it by chance that he tried one day to clamber up the wire just in front of the hornbeam, or did he consciously experiment? In any case, the facts show that quite young animals—they were then six or seven weeks old—are already able to accumulate experience and to profit by it, and learn from one another. Such cases cannot be explained by the latest animal psychology, with its complete reliance on instinct. Animals are neither stupid nor mindless, despite all the fine theories elaborated in the study; above all they are not mere instinctive and reflex mechanisms.

So almost hourly we had the pleasure of seeing the brother and sister at my house, until, as they grew older and more independent, they preferred to play truant in the shrubberies. They roamed about in well-

nigh unrestricted freedom; they even visited the elephants in the adjacent elephant-house, but had no great opinion of them; or from a hillock beside the outer wall they enjoyed the spectacle of the traffic in the Borghese gardens (now the Villa Umberto), to the astonishment of the passers-by, and especially the drivers in the cab-rank outside the gardens. It was a remarkable fact, yet characteristic of their feline nature, that as a result of their freedom these very tame animals gradually began to grow timid and wild. They still followed their faithful foster-mother when she appeared in their enclosure with their bottle of milk, while the midday meal of meat was usually taken before my hall door. Nervous individuals, and even the knacker who brought the horseflesh, no longer dared to mount the steps, for dinner was consumed in the open, and the tame little cubs seemed to have become incarnate devils. When they came home in the evening they were still given the bottle up to midnight. But there was no peace in the house. They overwhelmed their foster-mother with their jealous affection. Many an apron did they destroy, and if we did not keep a watchful eye on them they were always getting into fresh mischief. They would claw a plate off the table, or jump up at the roller-towel and tear it down, roller and all, or overturn buckets, or run off with the broom, or play other such tricks, comical enough but not wholly agreeable. Then they would fall asleep, a living footstool, under their foster-mother's feet. After a time they developed a troublesome habit of leaping upon the window-sill, which was very narrow, so that

they were in danger of falling out, and we had to keep the window shut.

Dilli and Hexe had now been household pets for more than three months, and were over four months old. They had repaid our care, for they had grown to be fine, powerful animals. We had accordingly to bid farewell to them as housemates; it was no longer possible to treat them as pets; moreover, the autumn was approaching, and the rainy season would have compelled us often to keep them indoors during the day. So Dilli and Hexe went forth into the world, being given into the charge of our trusty head keeper, Angelo. The first evening without our pets was truly lonesome, and there were tears in their foster-mother's eyes. But she contrived for some weeks longer to give them their milk. Three times daily she took them their broth, having previously warmed the milk in the kitchen. She was always welcomed with a howl of joy, and even in the summer of 1915 the two young lions, then three years old, would joyfully fall upon her neck, mewing and caressing her. Gradually, as they increased in size, their affection became rather too strenuous, and it would not have done to attend their receptions in one's Sunday clothes. Gradually Dilli and Hexe learned to drink milk out of a bowl. At first they trod in the milk and went on crying for the bottle. This might have been explained as due to lack of intelligence. But it was only a matter of custom, and even we *homines sapientes* are subject to the power of custom. Even man, to quote the poet, "claims custom as his nurse." Minced meat was soaked in a little milk,

and finally covered with it, so that the cubs learned to drink milk in order to get their meat.

Some weeks later they were given two companions —half-sisters, Nero being the father of all four. The mother of the two newcomers, whose names were Bobby and Saida, was, like Nero, an animal of exceptionally good character, whereas the mother of Dilli and Hexe was less good-tempered. We had purposely left Bobby and Saida with their mother; to judge by their parents they should have been very tame. But as soon as they were parted from their mother they became extremely shy, and even today they avoid one's hand as one enters their cage, while they gladly allow themselves to be stroked through the bars. They evidently feel safer with the iron bars between themselves and humanity. It is most interesting to observe, in the case of these offspring of one father, the effect of their different experiences in early youth, and of close intercourse with human beings. Dilli and Hexe are far superior to the others in intelligence. Hexe for some weeks appeared nervous, and even snapped at one's hand. This was not due to viciousness; the poor little creature was suffering from a thickening of the cornea, which is now cured, and, being unable to see clearly, snapped out of fear at the shadows which appeared before her eyes. But this is past history; and today she vies with her brother in playing with the head keeper, who romps with the pair as though they were children. This instance shows us once more how necessary it is to look closely into the reason for an animal's behavior, instead of destroying it as being treacherous, vicious,

or intractable, as is only too often done in the case of horses. Bobby's caresses are rather vehement; they consist mostly of bites and scratches; but he means to be affectionate and is not in the least vicious. All four have been excellently trained by the head keeper, and go through their tricks, which were taught solely by kindness, without the use of force, very nicely indeed.

Dilli and Hexe had a particular liking for striking colors and for articles made of fur, trying, when possible, to reach and tear them. Hexe was not at all fond of children, and often caused great alarm when foolish parents lifted their children over the guard-rail and held them close to the bars, so that they could see the young lions more plainly, or even stroke them. Parents do not in the least realize the danger of such proceedings; they are not aware that even those animals which are good-tempered with adults may entertain a pronounced dislike of children. It is difficult to decide whether this is due to their restlessness, or the brighter colors of their clothing, or their small stature and shrill voices, which fail to command the animal's respect. If dogs do not show this aversion it is because they, as domestic animals, are more good-tempered and less independent. Dogs, moreover, know what their duty is—what they may and may not do—and they control their feelings.

Dilli, from his earliest youth, has always been peculiarly jealous. He must always be the first to be caressed, and if any one tries to caress Hexe through the bars he will push her aside, or thrust himself between her and the grille, at the same time mewing

DILLI AND HEXE

plaintively. Hexe discreetly draws back, making way for the strong though not silent male. Of the so-called hetero-sexual preference—that is, the preference for persons of the opposite sex—these two animals showed no sign. Such preference, as a matter of fact, is by no means the rule. Of the many animals which I have known, such preference was conspicuously shown only by a female puma, and by the female red-rumped meercat of which I have already spoken.

So Dilli and Hexe have outgrown the nursery, and we are left with only a memory of lions as housemates. Many a frock, many a boot and shoe, and many a carpet succumbed to their treatment of it, so that the debit account of these children of the forest is by no means negligible. But we retain a pleasant and instructive memory of their infancy. Nevertheless, I should think twice before again keeping lion cubs as domestic pets.

DILLI subsequently achieved a world-wide reputation. Together with the tame cheetah, Chechina, the friend of the chimpanzee Gretchen, he appeared in the film of "Cleopatra," produced by the Cines Company, which was shown all the world over. But even more attention was aroused by the appearance of both these animals in the ballroom, on the occasion of a carnival ball in Rome, in the year 1913. The incident was reported in the newspapers and in Italy and elsewhere, and, particularly in the German press, it assumed such a singular form that the writer of these lines sent a true report of the matter to "The *Kölnische Zeitung*," which published the following article:

LION AND LEOPARD IN A BALLROOM

Under this heading appeared, in a number of German newspapers, and also in a small part of the 134th edition of "The Kölnische Zeitung," the following communication from a press correspondent:

"A great sensation was caused last Thursday in the skating-rink of one of the first hotels in Rome. Princess Radziwill, the leader of fashionable Roman society, and the daughter of the American millionaire Deacon, appeared in the ballroom in an ancient Roman chariot,

decorated with flowers and illuminated by tiny electric lights, and drawn by two magnificent horses. On one side of the chariot she led a lion and a leopard, which were chained together. Although a lion-tamer walked beside them with whip and revolver, the animals appeared to be greatly excited. The horses shied in all directions, while the startled guests thronged to the doors in order to reach safety. With much trouble the princess succeeded in guiding the chariot into the centre of the ballroom. The lion-tamer then took charge of the animals, but begged the guests not to applaud, in order to avoid further exciting the animals. The two beasts of prey then allowed themselves to be led quietly back to their cage, and the guests gradually returned to the ballroom."

Concerning this account, Dr. Knottnerus-Meyer, the Director of the Zoological Gardens of Rome, writes to us:

"The ball was given not in a skating-rink, but in the great ballroom of the Hotel Excelsior, though it was, to be sure, organized by the Roller-Skating Club. The club officials, approaching me through the manager of the hotel, asked me to lend them a couple of tame animals for the night of the ball, in order to prepare a really novel surprise for the Carnival. The animals were to pass through the ballroom beside a small pony-chaise with floral decorations. I accordingly chose, from among our animals, a female cheetah of fifteen months and a lion of eight months. Both were of course perfectly tame and tractable. The lion, with his sister, being orphaned at the age of three weeks, was reared by my housekeeper, and for five months the animals were inmates of my house. The cheetah was presented to us by an officer in the Somali sharpshooters, and has always been given complete liberty. The competent keeper took the cheetah and the head

keeper the lion, and the three of us, with the two wild beasts, drove to the hotel in an open cab. The animals behaved very intelligently. The cheetah—for the lion's companion was a cheetah, not a leopard!—took her place in the little *biga* (Roman chariot) beside the Princess Radziwill, and majestically gazed out at the ballroom. The animal is unusually fond of driving, and had already accompanied me on several cab-drives in the city. The 'king of beasts,' on the contrary, was somewhat curiously affected by the spectacle of so many people, lights, and colors. He was frightened, and his dearest friend, the head keeper, took him in his arms and walked behind the chariot. The public clapped loudly in applause and overwhelmed the 'savage' animals with caresses. Only the pony —there was, by the way, only *one* pony—showed signs of nervousness, merely because of the slippery nature of the dancing-floor and the thunder of his own hoofs on the parquet. However, his groom, who was leading him by the bridle, had no difficulty in quieting him. The cheetah's keeper walked beside the chariot. Neither of the keepers carried a whip or revolver; it was quite unnecessary to do so, and I should never have allowed it. Nor did the 'horses' shy; the little pony did so only once; and the Princess Radziwill did not drive him—he was led. No one thronged to the exits; on the contrary, the little creatures received only too many caresses, so closely were they surrounded. Again, no 'animal-tamer' requested the public not to applaud; for one thing, because no animal-tamer was present. The animals left the ballroom much more quietly than they had come, and drove home again in an open cab. There was no question of cages nor of a 'lion-tamer.' This is the truth. The appearance of the two animals was something of an event and was naturally

YOUNG LION
Bengasi

much spoken of. Even in the Italian press the gepard or cheetah was promoted to the rank of leopard or even tiger, and there was mention of whips, iron bars, and revolvers held in reserve!"

So, through the reports of—shall we say—imaginative newspapers the most senseless rumors may arise and, unfortunately, gain credence.

Chechina, the cheetah in question, arrived in February, 1912, when still wearing her youthful colors. She was only a few months old, having been found in November, 1911, by Captain Citerni, reared by him, and sent to us in Rome. It was interesting to see a cheetah in its first coat. The head and tail were coffee-colored, with darker spots, the rest of the body the color of *café-au-lait,* with chocolate-brown spots, while the tip of the tail was white. Gradually the little creature lost this light, woolly coat, and by the end of a year had assumed its true colors.

Chechina's entry into the gardens was most amusing. Her master telephoned to us asking us to fetch a *gatto pardo*—the usual Italian description of a cheetah. The horse-van was dispatched with the head keeper and the driver, to return with a rough-coated, perfectly tame little beast, barely the size of a terrier. *Tant de bruit pour une omelette!*

By day Chechina lived with a lion cub and a young terrier, in a temporary enclosure; by night she slept on a straw-covered wire mattress in the keepers' gangway of the large apes' house. The lion cub, Bengasi, was rickety, and presently died, when Chechina was

given a young female puma as her companion. But her relations with the lion cub, the puma, and the dog were never really cordial. Her first real friend was the chimpanzee Gretchen. With her she used to romp until she was tired out. In Gretchen's company she learned to eat all sorts of non-carnivorous food; she would willingly accept not only bread and milk but even potatoes and baked apples. But most of all she loved onions! If the chimpanzee was given onions, Chechina was jealous until allowed to go into Gretchen's cage, when the latter readily allowed her to share her food. A curious diet for a predatory carnivore! But is it not possible that the cats do occasionally eat vegetable food—fruit, for example—when at liberty? We know that bears, wolves, jackals, and the like do so.

For a time Chechina lived with Dilli and Hexe, after they were removed to the apes' house, but still slept on her spring mattress at night. At first both the cubs regarded her with respect, but this decreased as they grew bigger, and she became the exclusive companion of Gretchen and Pippo.

With human beings she was always good. At first we used to let her run free, especially in the mornings. She would accompany her keeper to the storeroom and kitchen, or would run off to the pond and frighten the waterfowl through the wire trellis. She took a particular delight in chasing the peacocks which ran about the gardens, crouching and lying in wait for them, and then leaping like a greyhound in pursuit, while they shrieked in terror. Of course, she never caught

one, but their cries of alarm, which always told us where she was, appeared to give her a particular pleasure. Once she went after the nandus, but they, with bristling plumage and outspread wings, took the offensive. Had she entered the enclosure of these eight great birds it would assuredly have gone ill with her.

It did go ill with her once when she was playing at liberty in the gardens. She was about to leap on a passing zebra from behind, as she often did on children. The zebra, without checking his pace, kicked out sideways like a donkey, and the obtrusive Chechina flew backward in a lofty curve. She gazed after the zebra with an expression of idiotic confusion, and hastily trotted away.

Chechina gave no signs of any special aversion to dogs. For children, however, she had no liking, and always looked askance at their bare legs. For this reason the unlimited freedom allowed her had to be restricted. Moreover, we were continually being warned by timid visitors that a "tiger" or "panther" had broken loose.

Shortly before her death she took part in a cinema production. She was taken to the studio in a motor-van, under collar and chain, although she was perfectly docile. Her part, however, had to be a passive one; she had to assume some of her majestic poses, for she was not fond of moving about. She would rather throw herself on the ground; and even though pulled to her feet by her neck and tail, she would not move a step. On such occasions she would even become violent, striking out with her forepaws and actually trying to

bite. She could scratch wickedly with her sharp dew-claws. On one occasion, having spent some time reclining on a couch by the side of *Cleopatra*, she was unwilling to resume her leather collar, threw herself on the ground, and struck her right-hand dew-claw into the back of my hand, tearing the skin for a space of some two inches.

One of Chechina's peculiarities was a frightful obstinacy. If she did not wish to move she would simply lie down, and then there was simply nothing to be done with her. Owing to this obstinacy, which seems to point to a limited intelligence, the cheetah is not a suitable subject for training. It is true that in India cheetahs are trained to hunt, but in this case it is an innate instinct which is exploited; the animal is not required to do anything that goes against the grain.

Some years ago we acquired two panthers which were trained for hunting. They were both females, by name Lisa and Linda. On their arrival they wore broad leather collars, and readily suffered themselves to be led on the chain. They were already full-grown. I frequently visited their den with a friend who wanted to photograph them, but it was always difficult to keep them at a distance; I often had to pull them back by the tail in order to get them far enough away from the camera. But they were constantly too quick for me, snuggling against us like cats and slipping between our legs with uplifted tails. We eventually removed their collars, as it was not wise to lead them about the gardens; not that they would have hurt any one, but the public do not understand such animals.

We know how easily a panic may be created, and the most good-tempered animals will sometimes cause injury if unintentionally irritated.

Linda and Lisa have always remained tame, and when any friend of theirs calls them they answer with plaintive voices and contend with one another for his caresses. Only at meal-times Linda, the darker of the two, is apt to be ill-tempered.

Two other young leopards enjoyed a longer period of restricted liberty. They were five months old when they came to us from Somaliland. Lieutenant Carnevali, of the Askari, took them from the nest and reared them on the bottle. Bobby and Lulu—both are males—are to this day as tame as cats, and they are now over three years old. At first we used to walk them a good deal, and whenever they saw a deer or the like they would crouch as though lying in ambush, and lie with every muscle tense, only the end of the tail, the cats' emotional barometer, moving to and fro. After a time they grew too powerful, and a special cage was built for them, with a house at the back.

In this cage they have a swing, a raised plank, a hurdle, and so forth, and they have gradually learned to do all sorts of tricks—for example, to jump through hoops. I have been accustomed to go into their cage unarmed, leaving even my stick outside. The animals seem to respect my confidence, for they always come to meet me much more joyfully than if I carried a whip or stick. Their manner of greeting is peculiar: with rounded backs, uplifted tails, and the hindquarters thrust sideways to right or left, they walk

purring round me, ravished with delight by the caresses bestowed on them. They are especially fond of jumping up on one's shoulders and licking one's face. I did not care for such attentions, out of regard for my clothes, and this they very soon understood. I must emphasize the fact that there was no question of such caresses being in any way dangerous. The most they did was to knock off the keeper's hat or cap. In the same way, they soon learned that I wished to be touched only with "velvet paws," and that they must not raise their paws at all if I embraced them. If they forgot this I took the paw by the wrist and gave it a little tap.

Whatever I asked of them they did willingly. Bobby liked best to jump, and then to stand with his forefeet on a high pedestal, in order to strike an attitude. This suited him best, and having done it he thought himself safe from further demands. However, he would also go on to the raised plank—it was only three inches wide, and springy—and there, like Lulu, would turn round and round. The swing, on the other hand, was Lulu's especial delight, while Bobby was afraid of it. One of their special treats was to tear an old boot to pieces, or an old coat hung up on a line. Playing with a ball wearied them far sooner.

No aversion to particular colors was perceptible in either; thus, the uniforms of the officers who often went into the cage with me made no impression on them. On the other hand, it was not advisable to leave one's handkerchief protruding from one's pocket; and Bobby,

sitting on his pedestal, once took a cigar from a visitor's mouth with his teeth. Like Dilli and Hexe, and indeed all beasts of prey, they had a peculiar passion for fur coats, muffs, necklets, etc., and for any pendent or trailing article of clothing, so that it was advisable for ladies to keep in the background. They had none of Chechina's dislike of children. People whom they liked they always knew again, even after many months' interval; there was then no peace until their friends had gone into their cage and caressed them. I have proved this myself, and so has their keeper, and their first owner, who is almost crushed by the loving attentions of his foster-children.

So far neither animal has shown the slightest sign of ill-temper; it seems as though Bobby and Lulu will always be good.

They had as companion a puma, an adult female. The keepers called her Jack. Her first owner, Marchese Guglielmi, who gave her to us, called her Pasha; but the name was ill-suited to the undergrown, rickety little creature. Jack was very tame, but less willing than Bobby and Lulu, and was apt to feel herself neglected. She was very jealous, but never thrust herself forward. At first she preferred to be stroked through the trellis; inside the cage she was apt to avoid one. Her sleeping-place at first lay at a distance of some fifty feet from her day cage. When she was released in the evening the keeper would cry: "Come, Jack, into your home!" and Jack would gallop across to her sleeping-cage and jump in of her own

accord. If called by her name she answered, as did Lisa and Linda, and Bobby and Lulu; and as lions will often do.

Once Jack was very ill. She could not walk, and a searching examination revealed the fact that she had been eating on her straw bed and had swallowed some straw with her food. Straw cannot be digested by the carnivora, and may lead to a fatal stoppage of the bowels. Jack was accordingly bound and given a clyster of soap and castor oil. The remedy was successful. By the same means we saved the life of a Siberian tiger, in Hagenbeck's *Tierpark*, who was suffering from a chronic obstruction, producing paralysis of the hind legs: most literally setting him on his legs again. Here again the animal had eaten straw with his food.

Jack cherished a particular aversion for persons of her own sex, whether women or children; if they came near her she became really unpleasant. She never forgot a blow. If struck, she would first try to bite as she ran past, and would only then use her claws. Kindness always evoked a response in kind, but she had no idea of returning good for evil. Panthers, leopards, and pumas were equally amenable to walking on the chain; they never threw themselves on the ground after the fashion of the cheetah.

Bobby died during the war, but Lulu I saw again after a lapse of five years. I went up to his cage, called him by name, and stroked him. It was obvious that he recognized me, so I went straight into his cage, and he then overwhelmed me with caresses. My old friend

THE CHEETAH
Chechina with her first playmates—the lion cub, Bengasi, and a dog

GRETCHEN AND CHECHINA
Playing in the open

Lulu really knew me again, and had remained faithful to me.

Other leopards had newly arrived: Katie from Lagos, and Peppino from Somaliland. Both were presents. Katie was for more than a year in Senator Piaggio's house at Geneva, and is quite tame. On the evening of her arrival I released her from her packing-case in my house, with the result that my housekeeper fled in the greatest haste; but she need not have done so, for Katie, then almost full-grown, behaved extremely well. At first we kept her alone, but she was then presented to Peppino. They were both of the same age. I shall never forget how they played together at their first meeting, until they were quite exhausted. Then they lay on their sides, closely embraced, with heaving flanks, until they had recovered breath; then the play began again, Katie always taking the offensive. Katie loved to spring against the trellis of her outdoor cage if any one approached, and she will bounce against any one who goes into her cage, but always without doing them any harm. Once when I was visiting the youthful pair in their cage I bent over Peppino to stroke him, when suddenly something heavy fell upon my head and shoulders; it was Katie. Playfully she took the back of my head into her mouth, unintentionally giving me a slight scratch. It was done only in play, with perhaps a slight admixture of jealousy. Usually Peppino was the jealous one. Even when we kept him alone he was not always quite tractable; it was advisable to take a stick into the cage. After his union with Katie he became as tame as she, but

jealous. Katie very often did not come when called, but drew back, and Peppino came forward. Katie, like Jack and Chechina, had the greatest dislike of children. I received a scratch while stroking her. Without my noticing it, a child had followed me to her cage. I sent the child away and shouted at Katie, when she immediately released my hand. In such cases the great thing is to keep still and retain one's presence of mind, for a quick withdrawal of the hand always causes a further protrusion of the claws: instinctively the animal tries to hold fast to its booty. Years ago I had a similar experience with Linda, the tame panther. I had stretched both arms through the grille and placed them caressingly round the animal's body, when she suddenly laid her right forepaw on my left arm. It was done only in play, and on my asking her: "Linda, what are you doing?" she drew her foot back without protruding the claws. Had I withdrawn my arm, by a reflex movement the claws would have protruded and my arm would have suffered badly, without any real ill-will on the part of the panther. Another Linda, a dwarf leopard from Somaliland, bit me on the left hand while I was stroking her and ripped open my middle finger; the copious bleeding prevented infection. Although a number of visitors and one head keeper were present, no one had noticed the incident, as I quickly put my hand into my pocket and wound my handkerchief round it. The explanation was this: the good Linda was ripe for mating, and I had tickled her throat, whereupon she bit me as a sort of involuntary

though violent caress. There was no question of treachery or temper, for Linda and her sister are so tame that one can pull them along by the tail and the scruff of the neck.

Lulu, in his old days—he has now been eleven years in the gardens—was given a new mate, a leopardess, Finette. We were afraid the old gentleman might be unamiable to her, so the head keeper and I went into his cage when we first put them together, in order if needful to bring them to reason. All went well, however. Finette played with Lulu, and this seemed to please him.

We only once had an ill-tempered leopard in the Zoo, Onnie, who came to us with Linda and Ellie; but we could not leave him together with them. He must have been caught when full-grown. He used to sit by the grille, apparently dozing, but in reality watching for opportunities to snatch at sticks, umbrellas, hats, or soldiers' caps. Every evening his cage held a collection of such articles. Unfortunately, only too many people find it amusing to tease animals behind the bars; yet nothing could be meaner or more cowardly! This leopard's end was extraordinary. He had to be transferred to another cage, lying back from the gangway, as his cage was required for some young lions. He seemed to suffer from the deprivation of his favorite pastime. One morning we found he had lost the claws of the left forefoot; a few days later two claws of the left hindfoot had gone; and then suddenly we found him dead. No cause of death could be ascertained.

I have to date visited ten leopards in their cages and have never once been attacked. The animals were young when they came to the gardens—most were something over a year old—and have remained always tame. Lulu is now twelve years old.

THE BROWN BEARS' GROTTO
Malayan bear, Martino; young brown bear, Peppino;
Battista; young Syrian bear, Turco

SOME BEAR STORIES

AFTER the monkeys, the bears are perhaps the favorite inhabitants of our gardens. Their quarters are always surrounded by crowds of appreciative onlookers. We Germans have in particular a tenderness for the brown bear, as a former inhabitant of our fatherland and the *Mr. Bruin* of the fable "Reynard the Fox." The inhabitants of the remotest village used to see him sooner or later, in the company of camels and monkeys, gracefully dancing before the astonished populace.

Even the visitors to our zoological gardens see the bears in a droll and comical light. Our inherited conception of the bear as a dancing animal that wears a muzzle and nose-ring, and is led literally by the nose by some uncouth Slav or Italian master, does not enhance its dignity in the eyes of the great majority. One cannot imagine the lion or tiger playing such a part. Fortunately, the strolling bear is a thing of the past; for its life was a long martyrdom.

In their youth bears are the drollest, clumsiest, most lovable little fellows, and generally tame as dogs. They will easily learn all sorts of little tricks. For example, the brown bear cub readily learns to hold its feeding-bottle in its forepaws. But even in such tiny fellows we often find the stubborn temper that in the adult bear becomes choleric.

There was such a little ruffian once (1910) in Hagenbeck's *Tierpark*. When he was led on the chain, and had ideas of his own as to the direction to be taken, he would without more ado rush at his keeper's legs, often with angry howls. The only thing to do then was to haul him up on his hind legs, in order to keep him at arm's length. He was very fond of going to the open-air restaurant, for he seemed to love music; and moreover, he was often given a lump of sugar or a cake. His attacks of rage were always indescribably comical in such a little fellow, but they were by no means harmless, for they came like a bolt out of the blue, often without visible cause, and when they seized him he would rush hither and thither, biting, as is the manner of bears.

Bears are often kept in company with other animals, and as a general thing are jolly if rather rough playmates, especially for the large cats, which incline to indolence. In Hanover, for example, a young brown bear lived for a long time with a young lioness. They were fast friends, and the companionship of the madcap little bear, always eager to play, was certainly good for the health of the lioness. Finally, however, he seemed to be mauling her rather too roughly and they were separated; but they both began to utter such howls of woe that they were reunited.

Another type of bear was Martino. His first impression of life and the human race had made him nervous and misanthropical and generally ill-tempered. He came to us when only a few months old. A peasant had found him in the Abruzzi and brought him to

us in Rome, leading or rather dragging the poor little beast by a chain fitter for an elephant. If he differed with his master he got a box on the ears or a kick. Obviously such treatment does not improve an animal's character.

Martino was intrusted to Tomassino, one of the monkey-keepers, a man who has for his charges a warm affection and a real understanding. His method was of course a very different one. Martino was put into a cage full of meercats, Java monkeys, raccoons, and badgers, and in course of time got on very well there. At first he shrank away from the other creatures, emitting the peculiar smacking sounds which in a bear denote anger mingled with alarm, and took refuge in the "climbing-tree." Afterward he became especially friendly with the badgers and often slept with them.

In accordance with orders, the keeper used often to walk him on a light chain, holding in his right hand a bamboo staff, which Martino would bite in his rage; at all events it prevented his biting the keeper's legs. Gradually he learned, when in his cage, to take food from the keeper's hand. He would have no dealings with other persons, and would not allow even his keeper to stroke him. He never came up to the grille, and as the bathing-trough was near the grille he bathed only when no one was about. Our hopes that he would grow tame in the course of time were not fulfilled. Ill-treatment suffered in youth has too fast a hold. Martino is still a man-hater.

After about a year in this cheerful society Martino twice opened the door of the cage, so we had to send

the little miscreant to join the other brown bears in the bears' grotto. It was high time, for his keeper's sake, for Tomassino had constantly to enter his cage.

The bear community of which he now became a member consisted of three brown bears, three Syrian bears, and one Malayan bear. This last, whose name was likewise Martino, was the real leader of the group and the bosom friend of the still adolescent Peppino, a brown bear. For a week all was well. No one in any way molested Martino. When he was first put into the inner cage his new companions were of course rather alarming to him. One after another they came to sniff at Martino, who made the usual smacking sounds indicative of alarm. The Syrian she-bear Jette, once an artiste, and a born comedienne, calmly licked the newcomer's muzzle, his gestures of wrath and alarm impressing her not at all. In the outer den Martino often tumbled into the moat, but was in no way molested by the others. On the other hand, he was always most unamiable to them. So perhaps ten days went by, when I heard revolver-shots from the bears' den. As I came up the keeper was desperately striking with a long iron bar at something in the moat. He had fired the revolver into the air, and had at least achieved this result—that the Malayan bear had drawn back from Martino; while Peppino had bitten into the breast of the Abruzzi bear and would not let go. The Abruzzi bear was still living, but rattling in its throat, while the blood was flowing from its muzzle. Unfortunately, the keeper had not had the courage to kill or shoot the comparatively worthless brown bear Peppino. The un-

SYRIAN BEAR
Turco

canny thing about this deadly combat was its absolute silence. In order to save the brown Martino I dropped a heavy mass of building-stone into the moat, right on to Peppino's head. The result was that the miscreant himself fell to the ground and stretched out his legs. I now armed some keepers with smaller stones and bade them bombard Peppino's hind-quarters, lest he should attempt to resume the attack. In the meantime a traveling-box had been brought up and Martino was hauled out of the moat with ropes and put into the box. He lived not quite a day longer; he ate and drank a little, but then died, as the autopsy showed, of internal hemorrhage. Peppino, after a few minutes, got upon his legs and staggered away. Only on the following day did he climb out of the moat. He must certainly have sustained a slight concussion of the brain; it was a pity that he did not die in Martino's place!

The keeper gave the following account of the fight: The Malayan bear Martino, the real leader of the band, had approached the Abruzzi bear with friendly intentions; but the latter, always surly and unreliable, fell upon him. This brought his friend Peppino into the field, and both tackled the Abruzzi bear. Peppino was violent by nature, and, although no more than half-grown, was the black sheep of the family. Some years before this he had attacked his keeper, wounding him severely, though fortunately the wounds were only skin-deep.

In an imaginative weekly journal, published in Milan, an equally imaginative artist published a draw-

ing (made, of course, in Milan) showing the keeper with six polar bears on top of him!

The other bears had held aloof, quite indifferent. They were all good-tempered animals, accustomed to men, and I have often gone into their den and taken many of my friends in with me, and have fed them by hand, holding an iron rod in my left hand in case of emergency.

We had also two gigantic she-bears, Battista and Jeanette, both of them fine examples of what a brown bear should be. Jeannette must have had a career as a public performer before she came to us, for she once danced a sort of minuet or gavotte with the keeper, who sang as they danced; holding her forelegs akimbo, just as the keeper held his arms—a most comical sight.

There was Lola, whom some brute had blinded. She was uncertain in her movements, and her food had to be pushed under her nose. She fell several times into the tank, but in course of time grew fond of bathing. She never played with other bears.

Then there is Jette. She is a Syrian bear, quite tame, and like Martino a bit of a clown. She once belonged to a troupe of performing animals, but had to be given the sack because she would never stay in her place but used to amuse herself behind her keeper's back by upsetting all the pedestals on which the lions and other animals were posing. This naturally led to general wrangling and disorder. She was very fond of smearing herself against newly-whitewashed grilles or doors. Once we found her gray as a donkey; the whitewash on the door of the grotto was not sufficiently

dried when the keeper admitted the bears, and Jette had promptly rubbed it off.

The two Syrian bears, Turco and Pasha, and the Malayan Martino were then still of the company. Martino, by sheer impudence, had assumed the leadership. Even the great brown bear Battista carried a record of his activities on his face. It was curious to see the little black bandy-legged fellow with his queer seal-like face playing the part of a despot. Peppino, as an opportunist, made friends with the hero. He could use his long claws in a most workmanlike manner, and such improvements in the grotto as were found necessary were always due to him.

Apart from the incidents related, the life of this mixed community has always been peaceful. All the bears know their names and know very well who are their friends. All will allow themselves to be stroked, excepting the blind Lola. Lola, like Jette, is still living with Turco and Pasha. Turco has learned to open the heavy door between the grotto and the inner cage for himself, pushing it upward with one of his forepaws.

Three great Siberian bears have been added to the company—Marco, Siberia, and Vasco. The two great he-bears have become good friends and play and wrestle, and the seven companions get on very well together. The command has now been assumed by the worthy old Jette; the far stronger but younger he-bears respect her age and sex. Lola trod the boards in her youth. Although more than thirty years old, she is still hale and hearty and a good and dutiful mother.

Bears do not always live so peacefully together. For

example, some years ago, in Hanover, a brown bear killed his mate by throttling her and drowning her in the tank! He dragged her into the water and then held the already helpless animal under the surface until she was dead. Here again we have the same uncanny, silent, and refined style of attack, and the same immoderate fury as in Martino's onslaught. So long as they growl and squeal as they wrangle, as they do over every scrap of food, no danger need be feared.

The majority of he-bears are not very amiable consorts; at feeding-time especially they are extremely brutal and unchivalrous. Like many a human paterfamilias, they insist on their rights as head of the household. Only in May and June, when his fancies turn to thoughts of love, does the father-bear reveal himself in an amiable light. At such times the lady takes command. Even at meal-times he is abstracted and will actually forget to eat. But we shall look in vain for that powerful and beautiful erotic excitement which is expressed in such stately fashion by the stags, and in a less degree by the greater cats. Even when in love the bear is comical.

Bears in a Zoo are always a special attraction and source of amusement, thanks to their habit of constantly appealing for charitable donations, nodding their heads and stretching their clumsy paws between the bars, and also to their noisy though harmless wrangling at meal-times, and their heartrending howls of woe when they get the worst of it on such occasions. After the monkeys and the elephants, he-bears are the greatest "draw." Bruin's trick of standing or even

walking on his hind legs never fails to delight the public, and the greedy fellow looks so human in his thick fur coat.

Being highly intelligent animals, the bears very soon recognize regular visitors to the gardens. Two brown bears in Hanover, though I might not have seen them for quite a long time, used always to hold out their paws to me when I saw them again, knowing that I never threw titbits to them but only gave them into their paws.

The courage of the bears stands in no relation to their physical strength. Their nature is enigmatical, half phlegmatic and half choleric. At one moment they will put up with anything; at another the most trifling incident will evoke the most immoderate fury. For example, an old Malay bear—quite a small animal—which was sold to a menagerie after living for years in a zoological collection, promptly killed his trainer.

Such sudden accesses of rage have often been observed in polar bears. In several cases the he-bear has strangled his mate. In the Roman Zoo, on the other hand, a male and female have lived together in peace for many years. When they are let into their cages in the evening each goes to its accustomed place, where its ration of food is placed. All is peace and order.

As a rule, the polar bears seem to be less intelligent than the brown bears. In their own inhospitable home they have no enemy other than man. The old legend of the untamable nature of the polar bear has long been exploded by the successes of the trainer. To realize this one has only to see Willy Hagenbeck in the midst of

his seventy white bears. Our polar bears in the Roman Zoo make no attempt to attack the keepers or other persons known to them, but withdraw to the upper part of the grotto. The fine big bears in Hagenbeck's *Tierpark* used to do the same when their grotto was being cleaned. A good sharply-cracking whip or a long forked pole are sufficient weapons. It is curious what a dread all bears have of this latter weapon; perhaps because it is easy, with a little dexterity, to catch them under the chin and throw them over backward. I once had to do this to an old baribal, which had to be bound in order to undergo an operation, but absolutely refused to step into a noose. He lay curled up in a corner of the cage, and two of the keepers had to go in to him. The head keeper and the bear-keeper, entering from an adjacent cage, tried with a long stick to push a noose over one leg. Suddenly the bear sprang up and seized his keeper by the arm, but at the same moment received such a blow on the head from the head keeper that he leaped back to his corner and remained there growling. Thanks to the head keeper's presence of mind the assistant was uninjured.

Now I myself went in with the head keeper, armed with the ominous forked pole. The head keeper again tried to push a noose over one of the bear's legs. This did not please the bear, and again he sprang at us, but this time we were ready for him. I caught the leaping animal under the chin with the fork and threw him back into the corner with all my might. He now confessed himself beaten; we succeeded in pushing the noose well up on the leg and passed the cord through the bars to

the keepers waiting outside, who forthwith pulled the noose tight and hauled the bear up against the bars, where the other three legs and the head were easily secured.

But to return to our polar bears. They seem, as a matter of fact, to be the best-tempered of all the bears. Even such an expert as Karl Hagenbeck was of this opinion. Their good temper becomes evident when it comes to training them. They are pre-eminent as performers, and learn more easily and willingly than other bears. In the rutting-season, however, little can be done with them. At this season one famous trainer used to allow the two bears of his troupe only to assume poses. The sole trick they then performed was to walk up to their trainer erect on their hind legs and receive a few figs. The gigantic he-bear, who overtopped his trainer by a head, was always amenable to him.

In the summer of 1910 Hagenbeck received a cargo of young polar bears. They were at once turned into the grotto among the adult bears. And what happened? The little spitfires were growling and howling with rage, being still in an evil temper from their long journey and close captivity. The legal occupiers merely withdrew to the higher regions of the grotto, and all was peace and concord. Another example of the good-nature of the bear! A good-nature not unmixed with laziness: such little spitfires were not worth the trouble of a fight.

It is interesting to see how the polar bears in Rome have become accustomed to the warmth, and enjoy it. They love to bask in the sun, throw themselves into the

water, and dry themselves in the sun. From November to April, however, these arctic animals rarely enter the water. It is then too cold for them! People are accustomed to pity them for having to live in the hot climate of Rome; but, as we see, the pity is misplaced. A gentleman who was not aware of my identity once assured me that "two powerful electrically-driven refrigerating machines" had been installed under the floor of the grotto, always keeping the ground "at freezing-point." Only thus could the animals endure the warm Italian climate. Under their feet the North Pole, on their backs the Roman sunlight!

Unlike the other bears, which are more vegetarian in diet, the polar bears are exclusively carnivorous. In the Zoo they are as a rule fed on meat or fish. But according to certain authorities they eat berries and algae in the summer, and the Roman specimens are particularly fond of cherries, apples, figs, or any other fruit in season. They will eat apples cooked or raw, and also bread, and boiled rice, and are especially fond of tripe or chitterlings stewed with bay-leaves.

While our polar bears will eat from my hand if I thrust it between the bars, I have not achieved more confidential relations with any of them. They are on the whole less excitable and therefore more harmless, but also more cautious than the brown and other bears. They are, by the way, most punctual animals. Our polar bears always call attention to themselves, both at the hour of their ceremonial meal in public and at their real dinner-time in the inner cage. They know the

FORMOSA BEAR
Teetjen

time just as exactly as each knows his own feeding-place.

One evening when they came into their inner cage, hungry as always, and fell upon their several portions, all five drew back, sniffing, and would not touch their food—retreating from it with terror and aversion. I asked the keeper what he had done to the food. At first he did not know what to say, but he then explained that he might have used the knife with which he had cut the bears' meat for cutting up the meat of a brown bear which had died, as food for the wolves, which were also under his charge. The scent of the bear's flesh had thus been conveyed to the polar bears' food, which they now refused to eat. It was still untouched on the following morning. The bears were filled with horror and loathing; they were not cannibals!

Two polar bears in the Hanover Zoo had a curious custom. If one wished to watch them bathing one had always to visit them at certain hours—if I remember rightly, at 9:30 or at 2:30. Except at these hours they never entered the water.

Now for Teetjen. Teetjen is an unusually fine Formosa bear. In the summer of 1916 I bought him for a very small price from a German steamer at Havre. His age would have been at most a year. On the steamer he had made great friends with a dog. He ran about at liberty and was fond of visiting the galley. He made the long journey from Paris together with Esau, the orang-utang, and he too was then declared as an ape, whereas he and Esau traveled from Havre to Paris as

hand-luggage. Had I declared him as a bear I should have been obliged to charter a special van, for Teetjen, though then scarcely bigger than a terrier, was one of the *animaux sauvages*, the *animali feroci*, which both in France and in Italy may only be carried in a special *vaggone completo*, as we call it in Italy. This rule, which of course tends to restrict or even prohibit any trade in such animals in these countries, is now long out of date.

However, whether it was that the French and Italian railway officials' knowledge of natural history was at fault, or whether they simply connived at the evasion of the senseless rule, as an ape Teetjen came safely to Rome. On the journey Teetjen repeatedly broke out of his box. He simply would not consent to be shut up, and on several occasions was in danger of being seized by the far from amiable Esau.

In Rome he found a home in the monkey community which afterward migrated to the monkey paradise; he was too small to be put with the other bears, and it would have been a pity to turn so tame an animal into the grotto. Among the monkeys he saw more of humanity, and remained conspicuously tame; and is so to this day, after thirteen years in the Zoo. His relations with the monkeys were from the first satisfactory; only if they stole the food out of his mouth did he show a little temper. He would then gallop round the cage with the scolding monkeys after him. Once Giorgio gave Teetjen a wound on the upper lip; otherwise the engagements were perfectly bloodless. Teetjen was too good-tempered, and his coat was too thick for the mon-

keys' teeth to penetrate. It was always amusing to watch him feeding amid the monkeys.

When the monkeys were removed to the "island," Teetjen had to change his cage. He could not be sent to the monkeys' paradise; he would have dealt with the light wooden houses, the swings, etc., after the manner of bears. He was therefore introduced to a company of meercats, mangabes, and badgers. The badgers were his particular friends. Here he remained until he was big enough to be transferred to a troop of baboons, with whom he lived until quite lately, in peaceful intercourse. Even the leader, the worthy Orfeo, had a great regard for Teetjen, who had now become a splendid specimen of his kind. In the winter they liked him to sleep with them. In the summer he lay in the water much of his time, and then the sphinx baboons, who are not lovers of water, preferred to keep out of his way. But all sat together at meal-times. The full-grown Formosa bear and the seven adult baboons would have made a unique photograph; but the light in the cage did not admit of taking one. Teetjen had to be very watchful, or the baboons would filch the food from his very mouth. If they were altogether too impudent he would begin to growl and rake his portion together with his paws. If he looked to the right, he was robbed from the left, and *vice versa.* Nevertheless, the baboons had a certain dread of the big black fellow's wrath.

Teetjen is on the best of terms with his keeper, taking apples or other titbits from his mouth. Until a few years ago he would allow the keeper to wrestle with him, but was never rough. I too have often wrestled

or struggled with him; and warm work I found it, for the strength of the bear is incredible. Teetjen often came to see me in my office or my house, being led on the chain. He liked to pick up the doormats, roll on his back, and play with them. He was always very ready to visit me, and would even come at a gallop, for he knew the way, and that fruit or chocolate awaited him; for which he always thanked me with a kiss on the cheeks. He continued to come even when full-grown, and always behaved well. He was not, however, allowed to come near my desk, for he was apt to make a clean sweep of everything on it.

It is rather surprising that he came to me so gladly, for apart from such visits he would refuse to go far from the monkey-house. He was once led out on the chain to be filmed, at a distance of some thirty yards from the house. However, he threw himself down and cried, and insisted on returning, and the film had to be exposed, after Teetjen had been brought to reason, close by the monkey-house.

During his first two years with us we used often to let him climb the acacias, of whose leaves both bears and monkeys are very fond—as they are of bamboo-leaves. His climbing feats delighted the public, and he came down only at meal-times. But I knew one magic word which would bring him. I had only to utter this and he would clamber down with all possible speed. It was *cioccolata* (chocolate). So tame and lovable a beast had naturally many friends, and Teetjen was often photographed. He has only one bad side to his character: he has no regard for assistant keepers or

THE POLAR BEARS' GROTTO

outside workers. He will not let them play with him, as his friends and his keeper may. In other respects Teetjen's behavior is just the same, whether to men, women, or children.

As a result of my departure in 1913 Teetjen got a little out of hand, and when he was given a wife, in the shape of Pucci, a female collared bear, he began to be jealous—though neither through her nor his two later mates, Pezzi and Hawa, did he experience the joys of paternity. Once, when his keeper was trying by personal intervention to compose a quarrel between him and Pucci, Teetjen turned on him. The keeper told me afterward that he shouted at the bear, calling him by name, for there was a green and dangerous light in the animal's eyes, whereupon Teetjen desisted and gazed at his keeper in astonishment, having, apparently, not recognized him in his anger.

Teetjen, who is now a gigantic fellow, will no longer allow himself to be taken out of his cage, and it is quite possible that he would not permit the three wives in whom he now rejoices to leave it. Two of his wives are tame; but Hawa will attack a visitor, especially if he carries a stick. She was trained as a performing bear and may have been badly treated.

Years ago there was a collared bear in the Frankfort Zoo whose cage the keeper used to enter. One day, when the keeper was present, a stone was thrown into the cage from outside the gardens and struck the bear; he angrily attacked the keeper, apparently thinking that the latter had in some incomprehensible fashion thrown the stone.

Next to the polar bear, the collared bear is now the most frequently chosen for performing in mixed troupes, together with lions, tigers, polar bears, and dogs. He always does his tricks very well, takes part in combined poses, turns somersaults, and walks up to his master on his hind legs to receive his reward of figs or sugar. He is willing and a good learner, but if struck he becomes refractory. He is more intelligent than the polar bear.

The brown bears also are extremely intelligent, and as sly as monkeys. Their intelligence is certainly far superior to that of the great cats. This may be because they habitually employ their paws as hands. No one has yet ventured to exhibit a troupe of ten or more brown bears. Such an exhibition would indeed be impossible; like the monkeys, the brown bears are too intelligent and too individual to be completely subservient to man. With polar bears the case is different.

SOME AMPHIBIOUS MAMMALS

IN the seventies and eighties of the last century a notable tragedy was enacted in the Far West: the slaughter of the bison herds of America, numbering millions upon millions of animals; the destruction at once of a magnificent creature and of a valuable national possession. More than a hundred years earlier a large amphibious mammal, called after its discoverer Steller's Sea-Cow (*Hydrodamalis stelleri Retzius*) and living in the Bering Straits, was extirpated within thirty years of its discovery. These are indeed brilliant examples of the rapid annihilation by human beings of their fellow-inhabitants on this earth, with which the unexampled destruction of wild animals in South Africa may fitly be compared. But there is another order of mammals which are still suffering greatly from the continual systematic persecution of man. These are the seals. The number of seals killed every year in the Arctic and Antarctic seas is deplorable. This insensate destruction of the riches of Nature has compelled the states bordering on the Arctic Ocean to take common measures of protection in the interests of these much-persecuted animals. Many of the sealers have followed the example of the whalers, and have turned to the even richer south, where there are no protective restrictions; so that there too the traces of the destroyer are becoming apparent.

In the north the giant among the seals is the walrus; in the south, the sea-elephant, animals over fifteen feet in length. Many fabulous tales used to be told of these sea-monsters. Many pictorial representations, some of which were good, some bad, and some merely conventional, revealed the zoological interest aroused by these creatures. The animal photographer provided us with a true picture; but the zoologist and the lover of animals alike longed to see the living creature. And some years ago some young walruses made their appearance at Hagenbeck's *Tierpark*, the first to arrive there for many years. They were eight in number; one of them lived for a long time in the Stellingen *Tierpark*. This animal was perfectly tame, and used to beg for his food by imprinting a hearty kiss from his bristly lips on his keeper's mouth. He also learned to blow a small whistle or trumpet—a thing the chimpanzees could not learn to do—and used to sing a sort of duet with a bobbin seal, he singing bass and the seal soprano. A fish was always the reward of this performance. It was difficult to accustom the great creature—used, in his northern home, to a diet of mussels, cockles, crabs, and so forth—to a substitute for his natural food. However, the thing had to be done, since for economical reasons he could hardly be fed on oysters and the like. It is interesting to observe how the walrus differs, in character and bearing, from the sea-lion, which in other respects it physically resembles; for like the sea-lion, and unlike the dog-seal and its relatives, it employs its hind limbs as legs when on the land. On the other hand, it has not the bodily and mental agility or the grace of

SEA-BEAR

TAME WALRUS IN HAGENBECK'S
TIERPARK

movement displayed by the sea-lion—often on the boards of the theatre.

In 1910 some living specimens of the sea-elephant arrived for the first time in Europe.

This southern giant is very different from its northern relative, the walrus: the body is slenderer, and more like that of a great dog-seal. Its hind limbs, like those of the eared seal, are useless on land. They trail behind it, and it moves forward in a sort of hopping crawl, contracting and humping its body. Like the dog-seal and the walrus, the sea-elephant has no outer ear. It has very peculiar eyes: large and round, and in young animals looking directly forward. They are about the size of a half-crown, and are so dark that the pupil cannot be seen. Over the eyes and across the ridge of the nose are some curious isolated hairs and tufts of hair; these are sensory organs. The flattening of the cornea is remarkable. This is an adaptation to the conditions of submarine life and vision, the degree of refraction being different under water, and is found in all the amphibious mammals, but is most conspicuous in the great eyes of the sea-elephant. The small, sideways-looking eyes of the walrus are very different.

The color of the sea-elephant is a uniform gray-brown on the upper parts, and the underside of the body is a grayish-white. When wet it appears dark brown. The sea-elephant is so called because of the proboscis-like prolongation of the nose in adult males. The scientific name, *Macrorhinus leoninus L.*, is more appropriate: *Macrorhinus* = long nose; *leoninus* = lion-like; for the old male acquires a little mane.

Hunted for its blubber and its hide, its range is already much restricted, and in some parts—as on the southern coasts of South America, and the Falkland Islands—it is now extinct, or at least extremely rare. Sea-elephants are still fairly numerous in the Kerguelens, and in the inhospitable regions of the Antarctic, which kindly Mother Nature has made all but inaccessible to that worst of all the beasts of prey—Man. Nevertheless, we must reckon with the fact that the sea-elephant is one of those animals which will, alas! within a measurable period become extinct. Consequently their introduction was welcomed with joy by zoologists and lovers of animals; it may indeed be called a memorable feat in the history of zoology. And it was due to a countryman of mine, Hagenbeck, to whom we Germans owe it that in the importation of wild animals Germany now holds the first place where once England was supreme. Until the war the Stellingen *Tierpark* had the finest accommodations for seals, and the richest collection of these animals. Only those who have had experience in the management of zoological gardens can fully realize the trouble and forethought and labor required for the capture of these animals and their safe transportation to Europe. After they had been tended for a few weeks in Buenos Aires they were shipped on board the steamship *Cap Ancona* for Hamburg. The female had refused all nourishment since her capture; but the male, a few days before sailing, began to accept dead fish. The female took her first nourishment at Vigo, in the shape of a conger-eel. Two galvanized-iron tanks, ten feet in

length and over six feet in depth, were provided on board, each full of running water. Thanks to the careful attention they received, the animals crossed the Equator in good condition and came safely to port, though the difficult question of diet had to be solved. The male readily ate the smaller shellfish, but the female would refuse dead fish; however, she consented to catch fresh-water eels in the water. Curiously enough, the male would have nothing to do with the eels. But as in winter the pond-eel buries itself in the mud, it was necessary to get the female used to some kind of fish that can always and easily be obtained. This required a great deal of patience; however, a lengthy fast will not hurt a sea-elephant. In the wild state they are accustomed, at the birth of their young, and until the following mating-season, a period of three to four months, to remain on the beach without entering the water or taking food.

The round head, the short snout, the big forward-looking eyes give the young sea-elephant quite a human expression. When it lifts itself above the surface of the water, showing the round, long-eyed head, the broad shoulders, and the slender neck, one can readily imagine that on seeing it at a distance, in a remote and lonely sea, the old sailors would have believed that a human being had appeared; and when, on diving, the fish-like extremity of the body is revealed, one can well understand how the fables of mermaids and mermen, with human heads and fishes' tails, may, indeed must, have originated. The animal's ability, even on land, in lifting itself upright as a post on its weak hind limbs

is astonishing, and is not shared even by the much more agile sea-lion. This, however, like the dog-seal and the walrus, seems to be lower in the intellectual scale than the sea-elephant. The latter has neither the startling agility of the sea-lion nor its intelligence, nor yet the curiosity of the dog-seal, but is more phlegmatic by nature. If one tries to touch the sea-elephant he opens his mouth in a menacing fashion and utters an ugly snarling cry. The brain is very small; sea-elephants are genuine arctic animals. However, they always show an affection for their keeper. Despite their conspicuously large eyes, they do not seem to have very good sight, hence the long sensory bristles over the eyes and on the ridge of the nose. The female above-mentioned once took a shellfish instead of an eel and only realized her mistake when she had swallowed it. But why should such a great creature be particularly intelligent? The sea offers it food in abundance, and it has no enemies apart from man; for the Antarctic is free of the terror of the arctic seals—the polar bear: as dangerous in the water as on the ice.

The seals most commonly seen in captivity are our German dog-seal, then the bobbin seal from the Baltic, and the Californian sea-lion. The collared seal and the antarctic sea-bear are rarer.

Of the two commonest German seals, the dog-seal and the bobbin seal, the latter is the more interesting; it is livelier and more agile than the dog-seal, as is the collared seal, and is apparently more intelligent. At all events, I do not remember having seen a dog-seal so well trained as the bobbin seal in Hagenbeck's *Tier-*

park which sang duets with the walrus. However, the bobbin seal and the dog-seal are not often trained as performers. The sea-lion, by the formation of its hind limbs, is better adapted for performing on land, and is also a more lively animal; today, therefore, it holds the first place among performing seals. The walrus is too bulky and heavy, and also too rare and expensive, and the same is true of the sea-elephant and other species.

Old seals are very seldom tame or tamable. They mostly refuse to be handled, or bite if kept out of water too long; however, they will come when they are called by name, and take fish from the hand.

The dog-seal is in general a very gentle creature, especially when young. There was in Hanover a young orphaned dog-seal, Paul by name, whom I would often carry in my arms if his fine silky coat were not too wet. This seemed to give the little creature the greatest satisfaction. His cry sounded like *pau*, hence his name. He would come at call, even out of the water, and gaze at me inquiringly with his big, intelligent eyes. He was always inconsolable when a friend quitted his enclosure; he would leap clumsily back into his tank in order not to be all alone. Like all the seals, the dog-seal is a gregarious animal, which must find solitude absolutely insupportable—indeed, in zoological gardens it has often proved fatal. In Berlin, however, a fine pair of dog-seals lived for upward of ten years, hale and hearty, in a small tank, and had many young.

To rear young dog-seals on the bottle is extremely difficult; the attempt is usually unsuccessful, as it is in the case of young otters. But I have succeeded with

otters, and hope yet to do so with young dog-seals. These are really lovable little creatures in their tameness and helplessness, and their evident longing for human society.

It is usual, and more interesting, to keep sea-lions in pairs or in larger companies. They are one of the great attractions in our zoological gardens, being indefatigably active and lively. Like other seals, they are seldom actually vicious, but they do not like to be handled, and old or young will avoid one's hand. Among themselves they are, like the dog-seals, most peaceable creatures. It is usual, however, as far as possible, to place only one male in a tank; but even so there will be a certain amount of biting at the mating-season and at feeding-times. A sea-lion has never had enough! The thick hide of an old sea-lion is often covered with scars.

Very remarkable in all the seals is their curiosity and their love of music. In this love of music, which was observed even in the young walrus at Hagenbeck's, the seal is almost unique among the predatory animals, nearly all of whom, especially the Canidae, have a most outspoken aversion to anything in the shape of music.

Trained sea-lions will perform almost incredible tricks—as jugglers and equilibrists, and even as musicians, strumming on guitars or mandolins, beating drums or gongs. They are quick in learning and understanding what is required of them.

Like the dog-seals in Berlin, the sea-lions at Cologne often had young. In general, however, seals rarely breed in captivity. Most of them indeed are barely old enough

for procreation, since the seal apparently matures rather slowly. Their environment does not seem to affect their fertility, for the tank of the Berlin dog-seals was old-fashioned and small. On the other hand, the rock-pool of the Cologne sea-lions, which affords an unprecedented opportunity of admiring their climbing powers, is perhaps the finest of its kind. Here the sea-lions are always in active movement. They are amazing swimmers, with their torpedo-shaped bodies, and are also dexterous rock-climbers, so that it is not astonishing that these animals should prove one of the chief attractions of any zoological garden. Their feeding-time provides a peculiarly interesting spectacle. They swallow down large fish as if they were gulps of water; for the sea-lions' teeth are small and weak, and adapted only for securing and retaining their prey, not for dividing it. In their stomachs, as in the gizzard of the bird, stones, intentionally swallowed, assist in the digestion of the food and triturate the fish-bones. The certainty and dexterity with which the sea-lion catches the fish thrown to him are really admirable. They are caught and disappear with lightning swiftness, and when feeding-time is over and the keeper takes his departure the insatiable animals hop after him, just as when he appears they leap toward him and try to steal the fish out of his pail.

In Cologne I once saw a young sea-lion. This was in 1901. It was delightful to see how lovingly the mother tended her baby. The tiny thing lay quietly on the rocks while the mother stood upright in the water below, calling the youngster to her with gestures and be-

seeching tones. Over and over again she would swim away and return, but all in vain: the little blockhead was immovable.

Sea-lions, as a rule, are long-lived in captivity and are not very delicate. However, just as in the case of the great cats the involuntary eating of straw may prove fatal, so in the case of the seals plant cellulose is indigestible. In a certain zoological garden a sea-lion died unexpectedly. Dissection revealed an enormous quantity of wholly undigested oak-leaves in the stomach, which had caused the creature's death. A number of oak-trees were growing round the tank, and in autumn their leaves fell into the water; and these the sea-lion involuntarily swallowed when catching under water the fish thrown to it for food.

In Rome we lost three sea-lions from the same cause. They avoided the water, and seemed to be asthmatic. Dissection in each case revealed innumerable flukes or hydatids in the cavities of the abdomen and thorax. The poor creatures actually died of suffocation. The infection must have been conveyed in the fish given them.

I have even been attacked on approaching two sea-lions thus affected. The animals, feeling ill, no longer entered the water; also they did not evade me as usual. One even pursued me on land, and only by opening and shutting my umbrella could I scare him off long enough to deceive him by throwing a stone into the water. Believing it to be a fish, the sea-lion leaped into the water after it, while I quickly and unobtrusively took my departure, for a moment later, having recog-

SEA-ELEPHANTS
The female emerging from the water

SEA-ELEPHANTS
In Hagenbeck's Tierpark. Note the characteristic pose

nized the deception, the beast was after me again, and probably still more eager to attack! The wide "radius of action" of a sea-lion's bite is, by the way, quite uncanny. The animal can stretch its neck in all directions to an incredible distance, and any one not on his guard may easily be bitten. Looking at the animal in a state of rest, one can have no conception of its startling agility, nor of the extensibility of the neck. What makes the sea-lion dangerous is its great reach, which the dog-seal, for example, does not possess.

One seal which the uninstructed may readily confuse with the sea-lion is the antarctic sea-bear. It has a mane on the neck, but this is difficult to distinguish when the animal is wet; and it is also smaller, and may therefore be recommended when fish are dear, as it costs less to feed. It is far less vivacious than the sea-lion, more retiring, and less agile. It does not come hopping toward the keeper directly he appears, begging for fish and running after him. Indeed, when sea-bears or dog-seals are kept in company with sea-lions one must see that they get their share of food, or the sea-lions will snap it all up before their noses.

However, they too are sometimes quick and dexterous. A sea-bear in Hagenbeck's *Tierpark* used to catch the sparrows that came to bathe or drink at his tank. Like the otter, Carlo, he would swim up to them under water and seize them, killing them with his teeth, and playing with them in the water for hours at a time.

Seals on the whole are intelligent and lovable animals, even though they seldom or never become so friendly to man as the large cats and many of the dog-

like carnivora. This, of course, is due to their way of life. The water offers them only too good an opportunity of avoiding all contact at will; and they seek it instinctively as their native element, which protects them from pursuit and gives them always a feeling of security.

PART III

AFRICAN ELEPHANT (TOTO) GRAZING

Note the look of his eye; he threw grass and sand at the photographer

CONCERNING ELEPHANTS

THE ordinary conception of the pachyderms is a purely popular one, unjustified in the eyes of the scientist, for the group of animals which was once included in this sub-order of ungulates has undergone division. While the elephants, as Proboscidea, now constitute a new sub-order of the ungulates, the rhinoceros and the tapir, with the horse and its kin, have been united in the sub-order of Solipedes, while the hippopotami and the swine are included in a special family of the Duopedes. However, as elephants, rhinoceroses, tapirs, and hippopotami are housed together in our zoological gardens, I may as well consider them together in these pages.

The elephant is a regular inmate of even our smaller zoological gardens, and is among the most familiar and favorite of animals. The imposing appearance of such a giant, with its remarkable prehensile organ, the trunk, which is now unparalleled in the world of animals, affords an unforgetable picture. I myself once, in the Roman Zoo, heard an astonished little boy exclaim to his mother: "Mamma, that animal is eating with its tail!"

Of the so-called pachyderms the elephant is by far the most intelligent, and in this respect the African elephant is apparently the superior of the Indian species. On the other hand, the Indian elephant is much more frequently seen in captivity, and in its native

country has become a regular worker and beast of burden.

There is something strange and enigmatical in the subjection of so huge an animal to man. This subjection is more conspicuous in the Indian elephant, for the African elephant always displays more independence. Nevertheless, the Indian elephant, when he is conscious of unjust and oppressive treatment, will often revenge himself. The old males in particular are extremely resentful of ill-treatment, and a day comes when there is no controlling them; but one must be on one's guard even with the females in the rutting season; at that time even the best of animals are often unreliable.

The elephant easily learns all the usual tricks which one sees it performing, such as playing a barrel-organ, dancing, giving a coin to the keeper in payment for a piece of bread, saying "Thank you" by trumpeting through the trunk, begging by bending a knee, and so on. But such things seem like a profanation of the animal, which combines with its immense bodily strength an intelligence of no mean order.

It is another matter when one sees the elephant at work, as one may at Hagenbeck's, hauling eight or ten lorries at a walk; or kneeling at his driver's word of command, pushing forward great blocks of stone with his forehead, and then, getting close to the stone again, repeating the thrust, until at last the stone is in its place; or grasping a balk of timber or tree-trunk and bearing it away, having first exactly determined its center of gravity. Such work is of course fatiguing and necessitates an increased food-ration.

One day near Hagenbeck's *Tierpark* a motor-car ran into a ditch and then stuck fast. The chauffeur suddenly bethought himself of asking Hagenbeck for assistance. Hagenbeck sent his trusty working elephant Ruma, a splendid female, and Ruma did herself credit. She quietly pressed her forehead against the back of the car and pushed it, without any appearance of exertion, out of the ditch and up on the causeway. The heavy vans and cages of wandering menageries and circuses are often brought up to the ground and pushed into position by elephants. What I have said of the great cats is true of the elephants also, and indeed of all sorts of animals—namely, they cannot endure to be shouted at. The hearing of animals, the elephant included, is so sensitive that we can speak to them quite softly and be plainly understood. The Indian mahout speaks quietly to his elephant, emphasizing his orders by kicking the beast behind the ears with his naked feet. The belief that one must necessarily shout at so huge an animal is of course comprehensible, but it is entirely erroneous.

Like all trained elephants, Ruma was a good teacher. One day some other elephants were roped to her in order to take them for a walk in the *Tierpark* and accustom them to walking in the open. The first to be roped to her was Minnie, an almost full-grown female, who was followed by a couple of smaller animals. The Indian mahout sat on Ruma's neck. They set out in good order, but things soon went amiss. Minnie took fright at something, thrust her ears forward, trumpeted in terror, and tried to turn about. Ruma straightway

turned round, beat Minnie soundly with her trunk, and pushed her into place again; indeed, the mahout had some difficulty in restraining Ruma's rather violent educational zeal. However, Minnie understood that resistance was useless, and after a few more lessons of this kind from Ruma she learned to accompany her willingly.

Minnie, however, remained a nervous animal, and is so still, now that she is in the Roman Zoo. She reached Stellingen in the summer of 1910, after a rough and protracted voyage, in a very emaciated condition, accompanied by a Genoese Catholic. After her arrival she was given, like other elephants, into the charge of the Bengali mahouts, who are Mohammedans; and these men tried in every possible way to distress her, pushing her food toward the great working elephants, Ruma and Risma, and declared that she was "bad," simply because she had been brought thither by a Christian—though of course they did not admit this! Moreover, they incited Ruma against her: Ruma, had the next stall to Minnie's, and was a far stronger animal. Of course, they were soon detected.

Minnie, although so good-natured, and thoroughly tractable, has always been shy of having her head touched, and if any one tries to touch it she will move it aside in alarm. Nevertheless, she is an excellent worker, moving stone and carrying timber just as Ruma does. A genuine Indian hunting howdah was once placed on her back, a cinema artist took his seat on it, and an exposure was made for a film entitled "Hunting in the Jungle," which was being produced

in Rome. Minnie set out quite willingly with her mahout on her neck, but then apparently the proceedings struck her as uncanny, and she began to throw herself about, in order to get rid of her burden. A sound beating quieted her, and the exposure was made. But scarcely had this been accomplished when Minnie began to trumpet, and tried to kneel down, and shook herself so that the howdah, which was not very strong, was loosed from its base and fell over, while the actor was able to save himself only by a flying leap. It may here be remarked that the driver may change his costume, and even make up as a negro instead of a Hindu, but the elephant remains unimpressed; his voice and scent are still the same.

Risma, the other working elephant, was, unlike Ruma, a very lazy beast, though a great eater. "That one no work, plenty eat," was the Hindus' just remark, while "Ruma very busy, work plenty."

Some years ago there were two peculiar types of elephant at Hagenbeck's, both of which were purchased from traveling circuses or menageries; both were females and very bad-tempered.

One of them, however, made friends with an old Swabian carpenter, Schorsch by name. He was the only person who could approach her. She would tenderly embrace him with her trunk, and followed him at a word. Schorsch even took her out into the open air on Sunday afternoons. After thus making her appearance she collected contributions on a plate which she held toward her admirers with her trunk. During her appearance in public, and on her way to and from her

stable, she showed not a sign of wickedness so long as Schorsch was with her. But woe to any one who approached her in her stable! She would strike at him with her trunk, or try to seize him, and would unquestionably have trampled on him. Only Schorsch could do with her what he chose. It was impossible to understand the basis of this friendship.

Another elephant was purchased from a traveling Scandinavian menagerie when this was broken up. She was a fine animal, but indescribably vicious. When her keeper had fastened her in her stable and gone away no one else could go near her. She had only one friend, a nanny-goat, for whom she showed the greatest affection. If the goat ran out of the stable the elephant began to scream and was terribly restless. The goat must always be close at hand and eat with her and sleep at her side. The goat, after the manner of goats, was of course a most impudent animal, and the elephant had to put up with all her tricks.

The increasing ill-temper of the elephant unfortunately put an end to this friendship; there was no help for it, the elephant had to be killed. And then it appeared that the poor creature had suffered from a cerebral fistula. What pain the poor beast must have suffered! This undoubtedly explained her increasing ill-temper, which bordered on insanity.

With Minnie two younger elephants came to Rome in 1910—an Indian female, Greti, and an African male, Toto.

Shortly before this, Greti had arrived in Stellingen with a large batch of young elephants. Late in the eve-

ning they came on foot from the railway station, all naturally tired, hungry, and thirsty. They were roped securely in the elephant-stable and were given food and drink. One little fellow—he was only three feet high—was quite indignant, and screamed and refused to be tied up. With a jerk he hurled himself sideways—and the three strong men who were holding him lay on the ground. Even in this pig-headed little creature one could sense the fabulous strength of the elephant and realize how difficult, how impossible even, it is to lead such a gigantic animal by force and against its will. It was pretty to see with what interest the adult elephants, however unamiable to one another, regarded this little creature, trying to mother it and caressing it with their trunks. The maternal instinct was apparently strong in them, though they cannot have experienced the joys of maternity for many a year, if ever they did.

Of this batch of elephants Greti came to Rome. She was intended, with Toto, to take children for rides on her back. While in Stellingen she had worn an empty saddle, with seats on either side, it did not please her to do so in her new surroundings, and she objected more particularly when the seats were filled; she would then scream and lurch to right and left, and the children who were to have had a trial ride gratis hastily jumped down. There was nothing to be done with her. This behavior was due partly to fear—for she was naturally very nervous and extremely short-sighted—and partly to obstinacy. There were often amusing scenes when she was being saddled. Sometimes she would

throw herself down or try to throw off the saddle before it was made fast, and would scream as though she had been goaded. Eventually we had to surrender, in the interests of the children's safety; and meanwhile Greti had become a fine, big, powerful animal, and had outgrown the saddle.

When the three elephants were led out to graze, the dignified Minnie in the van, Greti was always full of mischief, tearing off branches, breaking railings, or ruining flower-beds, so that she required careful watching. White or red flowers seemed to have a special attraction for her. The other two elephants never played such tricks; they knew very well what was allowed and what forbidden—and so, for that matter, did Greti. They, however, behaved themselves correctly, while Greti had continually to be warned or admonished, whereupon she assumed an expression of conscious guilt. If she were left behind, she would run round the compound until the others returned, her trunk uplifted a little, roaring with all her might; and she would behave in this way even if Minnie were taken out alone. On the other hand, Greti was active and dexterous; for example, she was fond of walking along a narrow wall which enclosed the bathing-tank. But her favorite trick was to tease the keeper by snatching his broom or scoop from his hands, or upsetting his wheelbarrow, or giving him a push from behind with her head or forehead. She never struck any one with her trunk and she never delivered a frontal attack. If any one went swiftly toward her she always drew back, and quickly too if he

had a key in his hand; she probably took this for a goad.

Greti's pushes could be rather unpleasant, and were never merely playful; but they were due to jealousy, for Greti always felt that she was neglected for Toto, the African elephant. Yet she was very fond of Toto. Once when his trunk was injured, and he was standing, chained, in a cage—a cage which Minnie had once occupied, and which is divided from the large inner cage only by a grille—Greti constantly stood by the bars and felt Toto's trunk with her own. In the evening, when hay was brought in as usual, and Toto was given none, for fear of irritating his trunk, Greti suddenly brought a good trunkful of hay and laid it before him. The sight of an elephant playing the Good Samaritan was indeed surprising, and I must confess I should hardly have believed it had I not seen it with my own eyes.

Greti and Toto were always united, especially when they wanted to tease one of their keepers. This keeper's name was Amerigo, so he was given the nickname of Vespucci. They would both pull his apron, go through his pockets, or overturn his barrow; and in the evening, when they had to be taken indoors, they had a special trick they used to play on him. They both shared Minnie's outer cage, Toto spent the night in an inner cage of his own. Amerigo used to take them both by the ear and lead them into Toto's cage, from which a connecting door led to the big inner cage. If he led one in and then went back for the other, the first

would inevitably run past him and out again, until the second keeper came to his assistance.

It was easy to see that they took a delight in teasing the man, and also that they knew very well with whom it was safe to take such liberties.

Toto, the African elephant, was a very different character from Greti. He was more serious, and always tractable and obedient, apart from this love of teasing. He is now about eighteen years old, and enjoys a certain fame as being the first living elephant imported from German East Africa. He was caught by the African traveler, Schomburgk, who some years previously had brought Hagenbeck his first dwarf hippopotamus. Toto had spent three years in Dar-es-Salaam. He had the greatest aversion to blacks, and invariably tore off their already scanty clothing. This aversion is often displayed by animals which have been kept by white men. Apart from the difference in language, the cause of this hatred is doubtless the different scent; native dogs, for example, dislike white men. As I have said before, the sense of smell plays a much more important part than is generally realized, both in friendship and in love. We have here a fundamental instinct which decides such matters both for beasts and for men.

When Toto was thirsty he would go to a pump and work it with his trunk, and then hold his mouth under the pump, without using his trunk for drinking, as he did at other times.

When Toto came to Stellingen in the summer of 1910 a thick reddish down covered his head, forehead,

and neck, the ridge of his back, and the top of his enormous ears. This down is usual in very young elephants. The jolly little fellow behaved quite nicely on his arrival when let out of his packing-case, only just at first he tried to run away from his new and perhaps alarming surroundings—from the many unfamiliar and therefore unpleasant noises, such as the roaring of lions, and the disagreeable odors, such as the scent of the lions and tigers. However, he followed his lord and master, who had brought him to Europe, to the quarters provided for him. There he could rub his tusks—which were about as long as one's finger—to his heart's content against the wooden walls. Captivity meant nothing to him.

Toto used to take a special delight in annexing ladies' hats through the bars. In this he was as dexterous as a monkey, so that he had at last to be tethered. But he was from the first both willing and good-tempered, and was never shy or timorous. He made no objection to wearing a saddle, and as long as it continued to fit him many children took rides on his back.

Above all, Toto was an excellent proof that the African elephant, if properly handled, can be made a serviceable worker. Its trunk is of course considerably weaker than that of the Indian elephant. Toto, however, was able to carry light burdens with his. The statement that the beast is untamable is, as has long been realized, a mere legend. It would be hard to say whether this legend owes its existence more to the indolence of the negro or to the greed of the ivory-hunter, who hoped to find, in the seeming uselessness of these

splendid animals, a good excuse for their wholesale slaughter. Some years before Toto's arrival, Hagenbeck, as he tells us in his book, once trained a young African elephant to carry loads on his back in a single day, in order to convince the incredulous Professor Virchow that such a thing was possible.

Moreover, the much-abused Congo State has employed elephants for road-building and the like, and Duke Adolf Friedrich of Mecklenburg took some excellent photographs of them during his journey across Africa. The Congo State has thus set a good example in the use of the African elephant as a worker; an example which hitherto, unfortunately, has not been followed by other colonial administrations. We must hope that it soon will be.

Toto was often photographed for the cinema, and always behaved in a quiet and dignified manner; but the operator had to keep his distance, or Toto would swing his ears forward and strike at the camera, or throw sand and bunches of grass at it and the photographer. He particularly disliked a red-haired young man who helped to take photographs in the Zoo, and once, with his ears swung forward, he drove him out of his cage, and would never allow him there again.

If one called Toto by name he would answer with a roar and come running up forthwith. When he did so I gave him a piece of chocolate. If I came with empty hands he bombarded me with sand. If I turned my back and took no notice of him, he would pelt me with sand until I turned round and felt in my pockets. As will be seen, the etiquette of even a well-bred elephant—and

Toto was that—is not the same as ours. Even my housekeeper, who always brought him dainties from the kitchen, was treated in the same fashion.

He was particularly fond of his head keeper, Angelo. He was always unwilling to part with him, and would hold him fast with his trunk. He would also kiss Angelo quite prettily, raising his trunk to do so. In the early days, when he was given rice boiled in milk, he always insisted on making sure that his milk-can was really empty before it was taken away, and if his keeper forgot to show him the can he would scream excitedly until he was satisfied.

He and Greti were always good friends. She would let him do anything with her, even punishing her with his short tusks. Minnie, on the other hand, hated the Afrikander, and would always push him aside or strike him with her trunk. Toto, for his part, was always much afraid of Minnie, and used to scream when she came near him. For this reason he was at first kept by himself, but later on all three were put together. Once, when little Toto was reaching out with his trunk over a dividing-wall, Minnie squeezed it with her head against the edge of the wall and hurt it badly, so that Toto for a long while was not allowed to eat hay. It was then that Greti gave him hers. Toto never forgot this incident of his youth. Nevertheless, Minnie helped to train him. Toto was afraid of the water when he came to Rome. While the two Indian elephants used to rush into the water with delight, he used to scream with terror, as though his life were in danger, if he merely saw the two elephants in the water. He was therefore chained to

Minnie, who had the chain fastened across her chest, and the head keeper rode the two of them into the tank. Toto, screaming with terror, had to go in, willy-nilly, and if he resisted too violently Minnie gave him a few whacks with her trunk. Elephants, as a matter of fact, seem to be born teachers. So Toto learned to take his bath, and since then has grown very fond of it. Both Toto and Greti used to romp about and turn somersaults in the water; but Toto never bathed together with Minnie. If she entered the water Toto quickly and unobtrusively got out.

Now that he is bigger, Minnie is more polite to him and he is less afraid of her; but they cannot endure one another. She is, on the other hand, very fond of Greti, so that it looks as though her dislike of Toto may be due to racial difference.

It is curious to see how eagerly and how punctually the elephants always go into the water if it is raining, or if they are conscious that a storm is coming. In any case they bathe regularly on cloudy days. In summer they bathe infallibly between two and three in the afternoon.

Greti died during the war. A great cow-elephant, Rosi, had been purchased and placed in Greti's quarters, without taking the precaution of chaining it up at night. Rosi attacked Greti and threw her to the ground. Greti—so I was told—lay there for some days and then died. It is not advisable to leave strange elephants together without precautions. Even when the animals are chained they may come to blows if within reach of

one another. In one of Hagenbeck's stables I once saw an elephant give another a push which sent the latter to the ground, carrying with it its neighbor on the other side. Elephants are by no means so good-natured as most people think, and those who have to deal with them will do well to take all precautions and never to put absolute trust in them.

Thus, I did not see Greti again after my return to Rome. But I found Minnie there, good-tempered as ever, and so she remained to the end. For two years or so she had been ailing. She no longer entered the water; she had slipped one day in going down into the tank, and had some trouble in getting out again. She no longer lay down at night—a bad sign in an elephant, as it is in a horse. She was capricious about her food and ate very slowly. In the winter she suffered at times from a nervous twitching, especially in the right foreleg. Toto was by this time a fine, powerful young elephant. One day he threw Minnie down, as she was not inclined to respond to his lovemaking. She lay on the ground for a day, then got up again. Then one morning Minnie was found lying in the stable. She had apparently fallen asleep on her feet and tumbled over. She had to be hauled up again with block and tackle, and it was interesting to see how she helped herself to her feet as soon as she understood the effect of the tackle.

A few weeks later she again fell down. This time our attempts to pull her up were useless. Minnie was already unconscious, and died without pain. The autopsy

revealed emphysema and atrophy of the kidneys. Her deliberation in eating was due to her shortness of breath.

Toto was no longer the droll little fellow he had been, but had become quite unsociable. In 1921, indeed, he took part in a performance of "Aïda," but this was his last appearance on the screen. Strangely enough, after my return he showed a pronounced aversion to me, and was always trying to throw dirt at me or to strike out at me with his trunk. Toto is a dangerous fellow, for he throws stones most cleverly, and even hits his mark! In the summer he had to turn out into the enclosure, as the stable door was being repaired. If I passed the enclosure at night he would rush against the bars with positively alarming force. If he could find stones he would throw them after me from quite a distance.

It therefore became advisable to chain him up at night. Even the head keeper, of whom he had been so fond, can now no longer go near him. On the other hand, he has an unbounded respect for his second keeper, and it is just as well that there is some one who can still control him. If Toto is altogether too insubordinate, I have only to call for Ivo, and Toto moves away, or behaves as though he had done nothing. But if I call Ivo's name on his day off it makes no impression on Toto; he knows perfectly well that his master is not available!

Toto was given a new stable-companion in the Sumatra elephant Pluto, once the leader of Krone's famous troupe of elephants. The two get on very well together, and it is interesting to see them, with their

ELEPHANTS BATHING
Greti, Toto and Minnie

handsome tusks, playing together, or pretending to fight in the water, which Pluto barely leaves all day long in the summer. At night, of course, they are separated. Pluto was sent to us as being vicious, but hitherto he has proved willing and docile, since Ivo, on his first day in Rome, had to give him a necessary reminder with the whip; for Pluto tried to attack him. Elephants dread the whip more than the goad, and it is preferable, since it does not wound the animals. It is possible that Pluto's character has improved, for he no longer has to work as he did in the circus, but lives like a lord. He readily allows himself to be chained, coming at call, and holding up his left forefoot for the chain to be attached or removed.

I myself once had a slight altercation with Pluto. It was on the day when Toto had thrown Minnie down. Toto, as a punishment, had been chained in the next stable; Pluto was in the outer enclosure, and the door leading from this to Minnie's stable was open. Suddenly Pluto appeared in the doorway, with outspread ears, in the posture of attack. I was alone, unarmed, and had no time to get out of the enclosure; so I shouted at Pluto with all my might: "*Zurück! Bist du verrückt?*" Plain German had its effect. Pluto turned round and disappeared. This instance showed once more how advisable it is to shout at animals only in case of necessity; shouting is then a natural means of defense. In such a case one would be defenseless against an animal that was always being shouted at.

A third bull-elephant in the Roman Zoo is Romeo, who also began his career in a circus. He is a splendid

animal, about thirty years of age; but ill-tempered. No one can go up to him in his stall. Over and over again he has squeezed stable hands against the wall, imprisoning them between his tusks, baffling all their attempts to escape, as he follows their movements by shifting his tusks up or down. The keeper Ivo once escaped from this situation only by stabbing Romeo, with all his might, under the chin with a clasp-knife.

Romeo is able to kick with quite peculiar dexterity, even through the bars. Once, when an under-keeper was working outside his cage, he gave the man a kick behind that sent him flying some yards through the air. Fortunately, he escaped with nothing worse than a fright.

Romeo delights in bathing, and when first he caught sight of the tank he trumpeted with joy and went almost crazy, romping in the water like a child. Insubordinate as he is at other times, he cuts quite a different figure the moment he is fastened up.

But it is not easy to tether him, for he adroitly avoids the nooses spread for him, and it needs the united efforts of several men to secure him. His attention is attracted by some one in front of him and the noose is pushed forward from behind. It must be drawn tight with lightning quickness if he steps back into it; and when this is done and the rope secured, Romeo is harmless as a lamb and quivers with fright, and the chains can be quietly made fast; while he keeps on smacking the ground with his upturned trunk—the well-known sign of warning, or of fear.

Like Fritz the macaque and Kapozzi the lion, ele-

phants will defend human beings against their own species, as was shown by little Dicky in Krone's troupe of elephants. Dicky was once thrown from his pedestal by another elephant and in falling dislocated his left shoulder, so that he could no longer take part in the performances. But he was a good creature, and was Pluto's stable-companion. While Pluto cherished a spite against the stablemen and used to attack them, Dicky would defend them, and more than once knocked Pluto down. He repeatedly released the men from unpleasant situations.

The reason why Greti was so nervous—and was often unjustly regarded as stubborn—was that her sight was poor. While the elephant's powers of sight are never remarkable, very bad sight or blindness is of course a serious disadvantage, for the sense of sight is by no means of such secondary importance as is believed by those who would divide animals into those that are guided by their eyes and those that depend on their sense of smell.

This was plainly observable in a blind cow-elephant, Kalifa, in the Berlin Zoo. She was always uncertain, and every night as she went into her inner cage she groped with trunk and feet for the step and the door. She bore a calf, but instead of accepting it she struck at it, so that it had to be taken from her. An attempt was made to rear it with the bottle, but without success. The failure was the more regrettable as this was the first young elephant born in any German zoological gardens. In Copenhagen and Schönbrunn, on the other hand, many young elephants have been born and reared

by their mothers. The reason why Kalifa repulsed her own offspring was simply that she could not see it and was therefore afraid of it. She was extremely nervous in every way and would often scream in her fear of imaginary dangers.

Elephants do not often fall ill. The majority live to a good old age and have in the end to be killed. If they do suffer from any painful complaint, elephants are liable to become vicious.

An old Indian elephant, Marly by name, in the Hanover Zoo, contracted a curious malady. The hide of the soles of her hind feet grew out in a curved excrescence until it cut into the skin of the shank. The cause of the trouble was uncertain; possibly it came from insufficient exercise, for Marly preferred to stand on one spot, only swaying the fore part of her body to right and left. Whether she acquired this habit on board ship or in a menagerie—for in either case she would have been chained—I am unable to say; but most probably in a menagerie, for the habit was deeply-rooted and permanent. To prevent complete lameness it was necessary to remove the growth. In one corner of the outer cage a trap was built up out of tree-trunks and the strong iron bars of the cage itself. Marly was deprived of drinking-water, but a bucket was placed in the trap, which she could reach only by entering the latter. For three days she went thirsty, and then entered the trap. The iron bar fell and she was caught. On a second occasion, many years later, Marly refused to enter the trap; she preferred to go thirsty. She began, indeed, to rage with thirst, so that she had to be given water.

After this she refused even to pass under an iron girder over the door leading into the hippopotamus's cage on her way to her bath, though she had formerly gone readily enough, and had been very fond of her bath. Apparently she suspected another trap.

The operation had therefore to be performed under an anesthetic. For this purpose nearly an ounce and a half of morphia and six bottles of sweetened rum were employed: enough morphia to send a whole parish to sleep! Like other elephants, Marly was very fond of alcohol; she drank her rum eagerly, fell quietly asleep, and was successfully operated on; the wounds were cauterized, and after a long sleep she woke, deadly miserable, with a terrible thirst. From that time onward she refused the friendliest offers of rum. Since the growth recurred, and Marly would no longer be tempted by the devilish liquor, but refused it more decidedly than politely, a further operation was impossible. Moreover, what with constant pain, lack of exercise, and the memory of her previous operations, she had grown vicious. She had therefore to be killed; she was only suffering needlessly. Like most old and sick elephants, she was strangled. This is the best and quickest method of killing an elephant; and there is no danger of the animal being merely wounded.

She was remarkably fond of lying on the ground in the sun. Many elephants never lie down at night, and then do so for a few hours only. They sleep on their feet, especially in the afternoon, when they lean with closed eyes against the wall or bars of their enclosure.

This is worth recording, because there is still a wide-

spread belief, even among educated people, that an elephant cannot lie down but leans against a tree-trunk when it wishes to sleep. Indeed, one may still find it stated in school-books that the savages capture elephants by sawing through the trees against which the beasts lean in order to sleep. They then fall down and are unable to get up again! One needs only to witness the agility, speed, and dexterity with which an elephant moves about, lies down, and gets up again, in order to recognize the full absurdity of this old-wives' tale; which Caesar, in his "Bellum Gallicum," tells of the German elk. But did Caesar himself believe the tale, or did he tell it only to astonish the citified Romans?

All the so-called pachyderms are distinguished by their unexpected physical activity, which is quite inconsistent with the first impression produced by their apparently awkward bodies. The massive elephant, moreover, moves as softly as though on rubber soles; which is explained by the anatomical formation of his foot. He may pass close behind you, and you are scarcely aware of him; his moving shadow may startle you before you realize his presence.

In conclusion, here are still a few more or less exciting adventures with elephants:

An adventure of a serious kind is described by Karl Hagenbeck in his book. His eight elephants were walking in procession through Munich, on the occasion of the centenary celebrations of 1888, when they took fright at a dragon which spat fire from its mouth, and ran away. However, no harm was done.

In Halle, one fine Sunday afternoon, the tame ele-

phant Bupari, one which the children used to ride, took fright and ran away across the *Restaurationsplatz*. There was, of course, a great upsetting of chairs and tables, but no one was hurt. Why it ran away I do not know; it may have been ill-treated, or provoked, or frightened, or tired and unwilling. In any case, the incident shows what responsibilities the Zoo assumes when it allows its animals to carry children.

A much more amusing incident occurred some thirty years ago in the Hanover Zoo. The elephant-keeper at that time was a brutal fellow, quite unsuited to his post; he constantly ill-treated his charges, and they feared him greatly. An elephant should, and indeed must, respect its keeper, but from respect to fear is a long step and one which ought never to be taken, for an ill-used and intimidated elephant is not only a distressing spectacle, but is dangerous, for sooner or later it will revenge itself; and its vengeance may easily cost the keeper his life. One day the keeper felt the elephant's trunk on his back, and paid an involuntary visit to the hippopotamus, who gave him a most unpleasant reception. Animals do not readily forget an injury.

Two of our elephants—Marly and the young bull-elephant Anton—were one morning in the outer enclosure while the keeper was cleaning the inner cage, removing the dung in a barrow. For convenience he had left the door to the outer enclosure open, and also the door in the stockade which opened upon the path. While he was busy in the elephant-house Marly and Anton forsook their inhospitable premises and made

their way across the gardens, which at that hour were empty. In so doing they did not keep exclusively to the footpaths, but ran through the wooden fence of the gardens as though it had been made of paper, or had simply not existed, and thus got away into the Hanover state forest, of which the zoological gardens form a part. Here they proceeded through the woods until they came to a dike, where they stopped for a drink and bathed. The numerous persons taking their morning walk in the forest received a lively if not wholly pleasant surprise when Indian elephants crossed their path in a German wood! However, the animals did no one any harm, and readily allowed themselves to be led home by such members of the staff of the gardens as had hastened after them. For the poor truants this little excursion had of course an unpleasant sequel, their keeper being a brute; though as a matter of fact he himself was far more deserving of a thrashing for his culpable neglect. Had not the elephants been more reasonable than their keeper, the affair might easily have ended in a tragedy.

THE HEAD KEEPER RIDES MORITZ

THE RHINOCEROS, THE HIPPOPOTAMUS, AND OTHERS

THE rhinoceros is less often seen than the elephant in our zoological gardens. Only the larger establishments can afford the luxury of possessing a rhinoceros, for it costs almost twice as much as an elephant. Moreover, since it is less manageable, the question of its transport is far more difficult. Schillings brought a young rhinoceros, in company with two goats, down to the African coast and thence to Europe, where he gave it to the Berlin Zoo. He was able to march only at night, when the moon was at the full, since during the day the little creature slept, on account of the great heat. Schillings describes the difficulties of this journey in his wonderful book, "With Flashlight and Rifle." In Berlin the rhinoceros continued for many years to enjoy the society of his two goats, from which he absolutely refused to be parted, and grew to be a magnificent animal.

On Sundays especially, when the price of admission was reduced, one had often occasion to realize that the otherwise wide-awake Berliner is not well grounded in zoology. Such dialogues as this might be heard: "Pa, what are the goats doing with that rhinoceros?" "He eats 'em." Or, "Pa, what are those?" "That's the old one, and the others are her little ones." Compared with the gradual development of a goat into a rhinoceros, the autumn transformation of the cuckoo into a spar-

row-hawk, in accordance with the old popular belief, is far more credible.

The rhinoceros is less intelligent than the elephant, and cannot, like the latter, be trained to useful ends. However, of those animals that I have seen—which were mostly young, or were caught when young—not one was actually vicious. Schillings's rhinoceros has always been well-behaved. In Alfeld, some years ago, a dealer had an African rhinoceros with whom his keeper used to play as one plays with a dog. This was a young animal from German East Africa. It was never treacherous, nor was it ever unconsciously rough, as a rhinoceros may very easily be; for what to him is a gentle caress or encouragement may be a smashing blow to the more slenderly-ribbed *homo sapiens*.

In the year 1910 three young rhinoceroses were imported by Hagenbeck. They came from German East Africa in company with the elephant Toto. They were nice little creatures, about the size of a domestic pig. The largest was also the shyest: for a long while he would not leave his traveling-box and venture out into his new home. The smallest was also the cheekiest; while the two larger ones would readily allow us to stroke them, the little one invariably attacked any one who approached him.

Two of these animals lived for a long while in the *Tierpark*, and were always good-tempered. A tank was installed for them, but they never entered the water. Perhaps they were too young; perhaps the German climate was too cold. In Rome the African rhinoceros goes into the water, but not often, and apparently not

very willingly. But it may be that the African rhinoceros in general is much less fond of the water than the Asiatic variety. The reports of travelers seem to prove this, and Schillings's photographs show the beast wallowing in swamps and bogs, but not in open water. Moritz, as we called our Roman rhinoceros, seldom went into his tank, which contained about thirty inches of water, and when he did he would as a rule only stand in the water and drink; only very rarely did he lie down in it, and it was by no means every day that he entered the tank at all, even in the height of summer; and in Rome it can be quite unpleasantly warm. When he came out again he would find a shady spot and go to sleep. Early in the morning, on the other hand, and in the evening he was very lively and would play with the head keeper, who used to pretend to fight him. Now and again Moritz would attack him—of course, only in play—throwing up his tail and lowering his head, and rushing forward as though shot from a gun, while his opponent would save himself by leaping to one side, or upon a small hillock.

Moritz used to have great sport with a sack stuffed with hay and hung from a beam at about the level of his head. He would have long fights with this sack, attacking now from one corner of his enclosure and now from another. In the long run, of course, he became exasperated by his opponent's lack of resistance, and then he would rush forward and bite the sack. When the game had become rather stale the sack disappeared, and after a few weeks he was given a new one, and again had great fun with it.

Moritz was never ill-tempered or uncertain; one could go up to him in his enclosure with complete confidence. Like Toto, he was very fond of chocolate; and when I called him he came to me at once, and I used to put the chocolate into his mouth. Like a horse, he loved to have me stroke his eyes with the flat of my hand, or to seize his horn and force his head up and down. If he had received any trifling injury he always patiently allowed it to be dressed. Once for some weeks I treated him for eczema and cured him. He was given a heap of locust-beans or cole-rape in a corner, and stood there quietly eating while a keeper scrubbed him with hot water and I dressed the sores afresh with powder and ointment. A second keeper stood at his head and talked to him. Apparently a rhinoceros is not very sensitive to pain, for Moritz never seemed at all distressed when he was scrubbed and the scabs removed from his sores. It is of course a great advantage to an animal to be so tame; without this daily treatment of his eczema Moritz would hardly have recovered; and what could we have done with a vicious or a merely intractable animal?

Moritz was imported by Hagenbeck in 1907; he came from Victoria Nyanza, and was then very young. He arrived in such bad condition that it was feared he would die, but careful treatment restored him to health, and he grew to be a fine example of his species. From Stellingen he came to Rome in 1910, and with us he lived four and a half years. He was always tame, and as the keepers paid him a great deal of attention his intelligence was perceptibly developed. He was partic-

ularly clever at shooting back the bolts of doors with his horn. He did not open a door merely by chance; he would go on trying until he succeeded. The bolts accordingly had to be changed, for early one morning Moritz opened the outer door of his cage. When I was summoned he was walking along in front of the elephants' cages, between the cages and the guard-rail. Since he could not turn round in this narrow space, I enticed him backward, step after step, by means of his favorite chocolate, until he reached the gangway between his own cage and that of the elephants. A few bales of straw made a sort of stairway into his cage, and he quietly went in again. The whole affair was quite amusing. It was about half-past seven in the morning when a keeper came to my house and informed me: "The rhinoceros is outside." Since it was a fine, sunny November morning, I replied: "That's all right." "No," he said, stuttering a little, "it's outside indoors!" At this I hurriedly finished dressing and hastened to the spot. The keepers, of course, had lost their heads, and had left both doors open; and there were already visitors in the house. I pretended that nothing unusual had occurred, fed Moritz with chocolate, and explained to the onlookers, in reply to their questions, that the animal was always allowed a little run when his cage was being cleaned, as he was extremely tame. Since nothing unusual appeared to be happening, the visitors soon withdrew and I at once had the doors locked; for the guard-rail being only of wire netting stretched between iron uprights, it was not precisely calculated to resist a rhinoceros.

If only the press had heard of the escaped rhinoceros! What would that imaginative Milanese artist have made of it—he who had depicted a keeper attacked by a young brown bear lying with six great polar bears on top of him!

This, by the way, occurred during the first few weeks of the gardens' existence, when the staff was still inexperienced, and it serves to show that it was not easy to make something out of nothing in a country which had hitherto possessed no zoological gardens, and where the rhinoceros was hardly known even by name.

Of his neighbor on the one side, an ill-tempered hippopotamus, Moritz took not the slightest notice; but he was very attentive to a tame tapir on the other side; the two animals used to feel one another's snouts with their lips, and even lick one another. Moritz was a bull, the tapir a female.

One day quite a crowd of visitors gathered about Moritz's cage, with true Italian vivacity discussing the weighty question whether Moritz was—edible! Moritz, who cost us a trifle of £950! A police officer quietly decided the matter, announcing that both Moritz or the tapir would taste very good. "Why not?" he said.

In January, 1915, Moritz lost his appetite for a time, and in walking he used his hind legs with peculiar caution, and lifted his feet very high. One morning when the keeper went to turn him out of his sleeping-place he did not get up. This was unusual, although in winter he liked to sleep late, lying on the straw until perhaps nine o'clock. He tried to rise, but could not

lift his hind-quarters, and his heart was apparently weak. He was lifted to his feet and walked up and down in the warm southern sun, which seemed to do him good. The same thing occurred again, and more than once, and then one day Moritz could no longer be lifted, but cried terribly, like a child, when the attempt was made. He presently became unconscious and two days later died. Dissection revealed a cardiac inflammation of many years' standing, rheumatic in origin. In a colder climate he could hardly have lived so long. Moritz's death was an irreparable loss to the gardens and a painful loss to his human friends. Just before his death I had injected a little milk; and when I saw that he was dead I am not ashamed to own that the tears came to my eyes. He was a good, faithful beast; such a rhinoceros as one will not easily find again.

Rhinoceroses will live a long while in captivity, as was shown by the old Indian rhino in Berlin, which came to the gardens in 1872 and was still living there in 1919. In summer this animal liked to lie submerged in the water all day. When it did come out it stood with open jaws against the bars, begging for food, which the visitors threw into its mouth.

The rhinoceros is not remarkable for its powers of sight; in this respect even the elephant is its superior. If I held a bar of chocolate before Moritz's eyes he took no notice of it, whether I held it close or at some little distance; but if I held it to one of his nostrils he immediately twitched up his upper lip, opened his mouth, and turned his head to receive the titbit.

Hippopotami are more frequently to be seen in zo-

ological gardens. They are considerably less costly than rhinoceroses.

It is a pity that the ancient Greeks called this giant river-dweller Hippopotamus, which means "river-horse," for the hippopotamus has no resemblance to the horse; it is really much more like a gigantic sort of pig, to which, as a matter of fact, it is not distantly related. Both the pig and the hippopotamus are non-ruminating, cloven-hoofed animals. The hippopotamus, moreover, like the wild pig, is aggressive and often vicious. Some fifty years ago a keeper in the Berlin Zoo was killed by a hippopotamus, crushed to death between its enormous jaws with their huge and sharp though not very numerous teeth.

Like the rhinoceros and the elephant, the hippopotamus lives long in captivity and some animals even become comparatively tame. The gigantic hippo in the Antwerp Zoo used to allow his keeper to open its great jaws for the delectation of visitors. A female hippopotamus in the Hanover gardens, which lived there for more than thirty years, even learned a few simple tricks when young and performed them until her death. Jeko —for that was her name—came out of the water and went in again at her keeper's bidding. She preferred returning to it, and at a sign from her keeper would open her jaws and throw the water into the air, so that the onlookers were in danger of a shower-bath. She would also run round and round like a tethered horse, and if her keeper signed to her she would lay herself down, when he mounted on her back as a sort of concluding apotheosis. Her expression when he did this

HIPPOPOTAMUS
Greco

RHINOCEROS
Moritz

was by no means cheerful; it was at once stupid and alarmed and ill-tempered, especially when she rolled her bloodshot eyes. I have seen only one other performing hippo—in Krone's circus. Jeko's first trainer was a keeper whose methods were extremely harsh, as the elephants also had reason to know. One day she squeezed him against the wall until he squealed, and for a long while he was confined to his bed.

Young hippos are very nice little beasts, and very tame. Their shape is not so uncouth as that of the adult animal, and they readily become attached to their keepers. Some years ago there was a young hippo in the Hanover Zoo—it came from German East Africa—which was quite tame, and had as companions two Nile geese, to which it grew so accustomed that it would not part with them. Hagenbeck too had at one time a hippopotamus which was so tame that it was allowed the run of the gardens, and when the Kaiser visited the Stellingen *Tierpark* a nephew of old Herr Hagenbeck's rode past him seated on its back.

Young hippos have been born, among other places, in Amsterdam, Antwerp, and Berlin. One was born here in Rome, but unfortunately the mother was blind and refused to feed it, and the attempt to rear it on the bottle was unsuccessful. The mother's behavior, like that of the elephant Kalifa, goes to prove that the eyes do not play such a very accessory part in the case of these repeatedly poor-sighted animals. In the hippo the sense of sight, however, is better developed than in the elephant and the rhinoceros.

Fourteen years ago Hagenbeck imported three hip-

pos from German East Africa; two were quite small, but one was already some years old. The young animals were good-tempered and came quietly out of their loose-boxes, but the bigger one, a bull, who bore the scars of many wounds, was said to be very ill-tempered. The box was opened so that the hippo had to emerge backward. One of the keepers climbed up the bars of the cage, which was over six feet in height, in order to pull up the sliding door, and remained there, sitting with straddled legs, waiting for the beast to come out. Slowly the excited animal moved backward; but scarcely had he emerged and caught sight of the keeper when he jumped in the air like a frog, and very nearly seized the keeper's leg. Fortunately, the man escaped with a bad fright.

This bull-hippo, Greco, came to Rome. Here he was as vicious as ever, so that for the keeper's protection a corner of his wide enclosure was railed off, as a place of refuge, with stout balks of timber; for when Greco came out of the water he always went for any one who chanced to be in the enclosure. His attacks, moreover, were made with bewildering swiftness and agility; he rushed forward as though shot from a gun, dropping his head as he started, but then raising it above the level of his body and twisting it round until one eye was uppermost, at the same time opening his enormous jaws, which finally clashed together before the stockade behind which the keeper had taken refuge. With hanging head, angry eyes, and a hangdog expression, Greco gazed on the field of battle and his intended victim, turned about, and lumbered away.

If one approached the bars of his indoor cage, Greco would take up his position right against the opposite wall, and, lowering his head, gaze angrily at the intruder. He would then make an unexpected rush at the bars, striking upward at them with his powerful eye-teeth, but without opening his mouth. Then, with lifted head and closed mouth, he would remain pressing against the bars. A few blows of the fist on his snout would recall him to order; after a few such reprimands he would very seldom try to attack the person in question, or would do so only when the latter turned his back to the cage.

By day Greco always slept lying in the water. If one called his name he would move his ears, lift his head, and snort. If any one imitated the roaring of a hippopotamus he would answer. One keeper used often to call him "Nilpferd," and this man Greco respected. Once, when he had been absent from the gardens for nearly a year, he found Greco dozing in the water, and cried out: "Nilpferd!" whereat Greco instantly raised his head, recognizing both the voice and the man.

In the evening Greco liked to walk to and fro in his "sand-cage"; but on fine summer evenings he was very unwilling to go indoors. If the keepers came he took refuge in the water. The cracking of whips made little impression on him, and even hunger failed to bring him out, so that Greco spent many nights in the open air. With the coming of autumn, however, he entered the water only during the warm hours of the day, and a little later he discontinued bathing altogether and

went into his winter quarters. In his whole character Greco was and is the antithesis of the steady, good-tempered Moritz, though he has indeed become very much quieter. He was doubtless caught when already adult, and he must also have been ill-treated, to judge by the many scars which he bore on his arrival in Germany. Animals never forget ill-treatment, and it makes them permanently vicious.

Our tapirs were good-tempered animals. The tapir is the oldest of the modern Solipedes, and is akin to the rhinoceros and also to the horse, but is conspicuously less intelligent.

The first tapir to come to us was a fine male brown tapir from South America. He came in 1910, with the great transport of animals from Hagenbeck's. In May, 1910, the weather in Stellingen being unusually hot, both this tapir and a Bengal tiger suffered from a kind of heat-stroke. It is a remarkable fact that no polar bears and no reindeer were thus affected. The houses were sprinkled with water and the skylights covered with awnings, and both tiger and tapir recovered.

It is hardly credible, but it is yet a fact that many tropical animals are far more sensitive to heat than the arctic fauna! The explanation is that in the wild state they withdraw during the heat of the day to some cool place of retreat, whether den or lair or wallow, and hunt or graze only in the cool hours of the night.

This tapir lived for about nine months in Rome. One morning he began to run to and fro behind the bars as though demented, and then, springing up

against them, fell back with open mouth and died. This fine animal, apparently in the best of health, had succumbed to a cardiac seizure, and this on the very day before the arrival of his intended mate from Naples! She was a present from the Zoological Institute of Naples, and had been living in the Botanical Gardens of that city. She bore what was really a masculine name —Ciccio, the Neapolitan diminutive of Francesco. Ciccio must have been teased a great deal, for she snapped as soon as one approached her. However, she lost this bad habit under quiet and kindly treatment. The time came when one could stroke her without remaining on one's guard. But she would not tolerate the use of force; "slowly and kindly" was her watchword. With a handful of clover or a carrot she could always be induced to follow, and could even be enticed into other enclosures, though she was always rather nervous. One day we had enticed her as far as the hippo's enclosure, in order that she might enjoy a swim in the big pool; but she refused to go into the water, and all our attempts to induce her to do so failed. Apparently she had scented the hippopotamus, and was afraid.

Once when a keeper snarled at her and threatened her with the whip, in order to drive her into an adjacent enclosure, she turned on him like a tiger, with bristling mane, and rushed at him with open mouth, so that he had to escape over the bars.

It was amusing to see Ciccio go into her stall and close the door herself. She did this on cold days and in the evening, and often too when the gardens were very crowded. Like all tapirs, she slept a great deal in the

daytime, or sat in the water, on her haunches, like a dog. She bathed all the year through. She knew her name, of course, and came at call. She eventually lost her sight, and died, without a long illness, of senile decay.

The members of the pig family are not very attractive in captivity. We had in Rome some half-domesticated wild swine, and in the next enclosure were two peccaries. Peccaries are small but courageous and pugnacious, and in herds are dangerous even to the puma and jaguar. When these two peccaries were turned out into their roomy enclosure the boar at once took up his position under a bush against the dividing fence and proceeded to gnash his teeth at the wild swine. If either of these came near the bars the little demon rushed at them with bristling mane and clashing jaws. His neighbors, however, barely noticed him. The pugnacious little hero persisted in this behavior for weeks before finally calming down. These peccaries made friends with their keeper, and liked him to scratch them. Such amiability is not universal; for peccaries only too often behave like perfect little demons and watch for every possible opportunity of biting their keeper. When these two peccaries saw their keeper approaching they always uttered a peculiar barking cry, not very loud, and almost plaintive. This was their way of begging for food. Although the peccaries had the opportunity of bathing, they never entered the water, and anxiously avoided any puddles in their enclosure. During the heat of the day they would dig themselves in under a bush and lie with their

backs covered. Peccaries apparently have no liking for the water. Their neighbors, the European wild swine, were, on the contrary, fond of their bathing-pool, but if the rain had made a few puddles in the holes where they had been rooting in the ground, they deserted the clean water of the pool for these miry wallows and plastered themselves with a thick coating of mud.

A singular creature is Chigo, a West African river-hog, who, when he came to us, was still clad in the striped coat of infancy, which he presently changed for the bright red peculiar to his tribe. At first he lived very peacefully with a troop of rhesus monkeys and a few tame young mandrills. The monkeys used to ride on him, and if he objected he would run beneath some low-hanging bough, in order to scrape the rider off his back. In the beginning this meant many a crack on the head for the bold riders, and elicited many a lively protest. But after a while the monkeys began to hang upon the flanks of their steed, as the Cossacks and red Indians do, when they approached a bough, so that the pig found it difficult to rid himself of his tormentors. Accordingly, he was placed in another cage, his only companions being a few rabbits. This did not please him at all; he ran to and fro, squeaking, and the very first night a rabbit disappeared down his gullet, whereas he had never done the monkeys any harm. He was then once more placed in an open-air cage, together with some makis, and there lived peacefully enough. The makis indeed used to ride on his back, and sleep on top of him, but they were not so tiresome as his former companions. Chigo eats all that his cage-

mates eat, and has remained as tame as of old, so that he can safely be allowed to run loose in the gardens. One day I photographed him in the snow—which is seldom seen in Rome. Chigo is omnivorous, like all pigs, as was proved by the poor rabbit, and a rat which I shot in his cage one evening; he devoured it before I could pick it up.

Chigo's attachment to the monkeys was evident when we turned him into a roomy antelope-run, believing that we were doing him a kindness. We were mistaken! For three days Chigo ran hither and thither and refused all food, until we sent him back to his beloved monkeys. In those few days he had actually lost flesh, but he soon recovered. He had grown up among monkeys, in a dealer's establishment at Havre, and loved their stimulating society above that of all other creatures.

GREVY ZEBRA
Nero, a Stallion

THE WILD ASS, THE ZEBRA, AND THE WILD HORSE

HOW long the ass has been domesticated who shall say? It must be a very long time, for of all the thousands of donkeys which I have seen in Italy not one was really vicious. Some, of course, were given to kicking; but this was due to ill-treatment, and particularly to the use of a pointed stick as a goad, of which some drivers are unfortunately guilty. In such cases the animal has come to dread any approach from behind.

But even such donkeys are harmless compared with the wild asses, of which the males are perfect demons. We had in Rome a wild Somali ass, called Marco, with whom nothing whatever could be done. He kicked and bit as though demented, and it was impossible to put him together with other animals. We tried putting him into an enclosure with a tame zebra mare, but she, being hard pressed, bit him in the fetlock and lamed him.

In the Zoological Gardens of Hanover a male ass of the same kidney was received as a boarder some years ago. He was a paragon of wickedness. He was particularly adroit in striking out with one foot through the vertical bars of his enclosure. All were thankful when the temporary guest was removed. There was a similar beauty in Cologne some thirty years ago.

But the most vicious wild ass I have ever seen was one that lived for many years in the Berlin Zoo. He was an Asiatic ass, a Kulam, and more dangerous than a beast of prey. On the side of the keepers' gangway, behind the inner cages of the old horses' house, the grille had to be raised, for the ass used to stand upright against the wooden wall of the gangway which was surmounted by the grille in question, and although the wall and grille together were six feet in height, he used to stretch his long neck over the top, reach downward, and snap at the keeper. He gave the impression that he intended to jump over the grille. Any one at the mercy of his teeth and hoofs would inevitably have been doomed.

Among the striped asses, the zebras, there are often very bad characters, though these occur less frequently among the large and handsome Grévy zebras of Abyssinia, of which Hagenbeck often had a great many, all of which could be led with a bridle. In the stables they stood, untied, each in his own stall. We had in Rome a pair of zebras from Hagenbeck's; they had already been driven between shafts and were therefore very tame. They never bit or kicked, but were quite "hand-tame." However, as the King of Italy gave the gardens a young imported stallion, a present from the Negus of Abyssinia, the young zebra was put to the mare, and the old stallion, Karl, was removed to the great ungulates' enclosure, being let into it on a halter. As he entered it the camels, buck sikas, sheep, goats, and zebras gazed at him inquisitively, and all crowded round the newcomer. At this Karl began to bray like

an ass, and now the whole company set off at a gallop, Karl along with them, still braying, and thus they went several times round the great enclosure. It would be hard to say which was the more frightened, Karl or his new companions, but at last they calmed down. The effect of this confused and many-colored mass of galloping beasts, with the zebra galloping along with them and braying as he galloped, was indescribably comical.

Karl was afterward sent to the *Jardin des Plantes* in Paris. There he lived a celibate life, and when I saw him again some six months later he at once came trotting from his stall, where he was munching hay, and allowed me to stroke him through the bars. He had recognized me at once, and I was sorry I could not take him back with me; for his successor was anything but tame. He was not really vicious, but he would not let any one come near him; he backed away, trying to keep his distance; and unfortunately the mare had become as wild as her new mate—indeed, she became even shyer. She is now tame only if driven into a corner. However, she tamed her mate—who was quite unbroken and impetuous—after a fashion of her own: by thundering kicks, delivered with both hind feet, until it seemed as though all his bones must crack; but the worst that happened was that he sometimes walked rather lame for a while.

To Nero's two wives a third was added, a Kilimanjaro zebra, by the name of Faid. But for her he felt the same aversion as for mares and she-asses: not content with kicking her, he seized her by the pastern, in

order to lift her up and throw her over. Faid had accordingly to return to the great ungulates' enclosure. She has an artistic career behind her, having belonged to a circus. If one approaches her she will kick out, but never bite. But as soon as a halter is thrown over her neck she stands as quiet as a lamb and allows herself to be bridled and led. Once she broke loose, but was easily caught again. In the stallion one could see how greatly animals are swayed by affections and aversions, and how strong is their racial feeling.

Newly imported Grévy zebras often suffer from a peculiar malady. The animals become distressingly thin, lose their appetite, and die. In such cases the wall of the stomach is found to contain spade-shaped flukes or hydatids the size of a sixpence or larger, often in very great numbers.

Another peculiar malady once destroyed a number of zebras in a zoological garden. They were all found dead, without any previous appearance of sickness. In every case the jaws were tightly closed and could not be opened. Death was due to tetanus, but the mode of infection remained a mystery.

The mountain zebra, and Böhm's zebra, which of late years have been imported from Kilimanjaro, are sometimes given to kicking and biting most viciously. At Hagenbeck's there were several of these zebras, which ate from their cribs like horses, but were nevertheless the most terrible miscreants. They had a predilection for squeezing against the wall any one who entered their stalls, and turning round to bite him, and would also kick forward with their hind feet.

There was a young male zebra of this kidney in the Hanover Zoo who was so given to biting that a special barrier had to be erected inside the enclosure to protect the visitors from his teeth. Another, in the Berlin Zoo, used to turn his back on his admirers and then, with bewildering dexterity, kick out backward through the bars.

I still shudder when I recall a scene which I witnessed, while still a schoolboy, in the Hanover Zoo. One morning, the keeper being off duty, an assistant keeper entered the zebras' cage with their evening ration of hay. The cage contained a fine pair of Chapman's zebras. The man had scarcely entered the cage and removed the straw rope from a truss of hay when both animals, as though by agreement, attacked him with their teeth and hoofs. It was all the man could do, laying desperately about him with the straw rope, to reach the door of the cage, which was fortunately close at hand. It was a truly horrible sight! Even the regular keeper could not go into the cage without a whip. He had neglected to warn his assistant against the zebras, and his neglect came near to costing the man dear.

Yet these animals can be successfully tamed, and broken to the saddle or to harness!

Zebras have often been driven in harness. One of the Rothschild family has for years driven zebras, so have the Signori Mele of Naples; the Rothschild zebras have even drawn a four-in-hand. Of late years the recommendations of the London conference for the protection of big game, Hagenbeck's experiments in

training and crossing zebras, the success of Schumann and Busch in training the animals for the stage or circus, and Schillings's wonderful book, "With Flashlight and Rifle," have reawakened the public interest in the zebra and its economic exploitation.

In tropical Africa man has always lacked a riding-animal and beast of burden that was proof against the terrible tsetse-fly and the very great difference between the temperature of the day and that of the night. The extreme southern variety of zebra—for there are quite a number of different species, varying in size and color—has already been extirpated, and so have the quagga (which is almost free from stripes), the mountain zebra (very like the ass, with dark brown markings all over the body), and Burchell's zebra (which is yellow, with dull brown stripes). There are, or were, small herds on the Boer farms; but the lover of nature hardly dares to ask what the campaigns of the great war, and the native rising in German Southwest Africa, have left surviving of the big game of South Africa. Fortunately, as the result of the London conference, the zebra, whose economic value has been properly recognized, is now included among the protected animals.

For a long time the belief obtained that the zebra was untamable. This may have been based on the fact that the natives of Africa were nowhere found to possess domestic animals of this species. But it would be impossible to imagine any one more unfitted than the negro for the training and vending of domestic ani-

mals. He regards even the African elephant as untamable, an error long abandoned by all who have expert knowledge of the animal. Consider, in this connection, what the Indian has accomplished in taming and domesticating animals! Such domestic animals as the negro does possess he has acquired from other peoples—from Arab and Indian traders; or in some cases they are of stock introduced from Europe.

Karl Hagenbeck, some years ago, began to break-in zebras with the aid of ponies. I remember seeing in his *Tierpark* a considerable herd of Kilimanjaro zebras, which he had determined to break-in one at a time. He told me that he purposed to do this within a fortnight.

But the zebra as it is today bears the bonds of servitude only with reluctance. It will drive home to its stable willingly enough, provided it has not to draw too heavy a load; but otherwise it will work only under the strongest compulsion. As in the case of the railways in certain countries, one knows when one will start, but not when one will return. Its natural wildness is always liable to come to the surface—as was demonstrated by a zebra in the Schumann circus, who, after years of tractable behavior, broke loose at a rehearsal and for hours defied all attempts at recapture. Although in the wild state fugitive rather than pugnacious, the zebra is often thoroughly malicious, and his kick and above all his terrible teeth are dangerous. On the other hand, at Hagenbeck's I have gone quietly into the midst of a herd of Kilimanjaro zebras (to be

sure, I had the keeper with me) and not one of those magnificent animals showed any signs of ill-temper. On the whole, however, the big, handsome Grévy zebras are the most good-tempered.

At all events, if any proof were needed, the results of training show that the zebra can be broken-in. But all the more intelligent animals are tamable if they are not too old when captured.

But if the zebra is to be made economically serviceable it must be domesticated, not merely tamed. The precedents are in its favor. The zebra belongs to the Solipedes, which have already furnished us with two valuable domestic animals—the ass and the horse—and, like all its order, is a social or gregarious animal. How far can we reckon with certainty on this social character of the zebra? The horse and the ass will inform us. They too were once wild and savage nomads, before human hands and human influence made them what they are today. It has taken hundreds, indeed thousands, of years to make the horse the docile creature that we know. We see him today as an animal whose will has been broken by generations of servitude, of physical and mental control. Even a few centuries ago the horse was a much fiercer animal than he is today. If our horses today are phlegmatic and docile as lambs, it is only the result of the persistent elimination from the strain of all vicious animals. Vicious horses are now an exception; but even into the last century this phlegmatic animal retained its natural inclination to bite. Consequently the breeding of zebras as domestic animals would require much patience

GREVY ZEBRAS
Karl and Hansi

and a long period of time. The selective breeding of such animals would have to be undertaken in special stud-farms. Private means would not suffice for enterprises of this nature, nor would private undertakings offer any assurance of protracted and persistent selective breeding. It would be necessary for the State to give a lead, as it has done, in Germany and elsewhere, in the matter of horse-breeding. We may safely assume that, thanks to our experience in horse-breeding, appreciable results would be obtainable in a few generations.

Hybrids, it should be noted, can be obtained by crossing the zebra with the horse and the ass. Such "zebroids" have been bred in the Berlin zoological gardens, and also by Karl Hagenbeck. They are of course infertile. Experiments were made to test the usefulness of these hybrids in the tropics, especially in the fly belts. They are apparently both tsetse- and climate-proof. We are now only at the beginning of this experiment, whose completion will demand both time and money; yet it is already possible to declare with some certainty that the zebra seems destined to play an important part in Africa, both as a beast of burden and as a riding-animal.

Even our northern horse has been developed from very raw material, our blood-stock originating from Asiatic strains. Although the wild horses of America and Europe are now extinct, there is, fortunately, still a genuine wild horse extant in Central Asia, in the Tsungarei. It is called, after its discoverer, the Przevalski horse. Among the many services for which zo-

ological science has to thank the late Karl Hagenbeck we must count the importation, in 1901, of a large transport of Przevalski foals, accompanied by Khirgiz mares as foster-mothers. Two of these foals were acquired from Stellingen by the Berlin zoological gardens. Although they were suckled by tame mares, they remained extremely shy, though not viciously aggressive. There was only one vicious beast among them, a stallion, which remained with Hagenbeck. He was described to me as being vicious, but he never molested me when I went up to him in his enclosure; and once, when he was rather rough to a pony mare, energetic intervention was enough to recall him to reason. To the best of my knowledge, no attempts have been made to break this horse to saddle or harness, whether by Hagenbeck, or Falz-Fein in his *Tierpark* at Ascania Nova (in the Chersonese), or the Duke of Bedford at Woburn Abbey; nor has the experiment been made of crossing it with the ass or domestic horse. Neither have I heard of the Przevalski horse having been bred in captivity.

These wild horses—which were hunted by the ancient Assyrians, as is shown by their realistic bas-reliefs —are raw material indeed. Yet, out of them our own noble horse has been fashioned—still another proof that something useful can and must be made of the zebra.

SOME RUMINANTS

WE now come to the camel—which is to us a much less sympathetic animal than the horse or the zebra. For thousands of years the camel has been the most important beast of burden in its native lands. Only small herds of the two-humped camel are still living in the wild state in Central Asia (in the Lob Nor). Hitherto no wild camels have been exhibited in our zoological gardens. But the tame camel, in the pathless deserts of sand or stony wastes of its lands of origin, performs precisely the same function as our railways.

Even in our zoological gardens the camel may be employed in useful work. Camels assisted most diligently in the laying-out of Hagenbeck's *Tierpark*. These were of the two-humped Asiatic variety, which is less affected by climate than the dromedary. They worked very slowly, it is true, but willingly. Even in Rome we have employed a two-humped female from Hagenbeck's in work about the gardens. When harnessed, the camel pulls with the fore hump. It cannot wear the ordinary harness or collar, as the neck is set too low, and pressure on the windpipe would interfere with its breathing, so the harness consists of a broad strap fore and aft of the fore hump, and a girth or belly-band. The mares go very willingly in harness, are very enduring, and never shy. On the other hand, it

is dangerous to drive camels through the streets, for horses are terribly afraid of them and are apt to shy at them and bolt. The same may be said of elephants; the scent of both animals is evidently most repugnant to the horse. The scent of the elephant is, as a matter of fact, very penetrating and soon clings to one's clothing. If you have much to do with elephants you must change your clothing before you mingle in other society. The male of our pair of camels in Rome was much less tractable than his mate. He was not fond of work, and any attempt to approach him was repulsed with more decision than courtesy. He did not indeed kick or stamp, but he spat; an unpleasing habit often found in camels, and in their cousins the llamas. Also he occasionally tried to bite one's hand, or rather snapped hesitatingly at the air, but a good box on the ears taught him that this was not allowed. It seemed as though he had at some time or other earned a sound thrashing for biting; he evidently wanted to bite, but did not quite dare to do so.

On the other hand, he was a good husband, and his better half presented us with two young ones, the second of which was a particularly sturdy beast. He was given the pretty Piedmontese nickname of Bombonnin. Like all young camels, he was a droll little creature, with his grotesque figure, his four enormously long legs and his abbreviated body. We let him run loose in the gardens when his mother was in harness. Bombonnin had no regard for obstacles. Every other minute he would run up against wire or barbed wire fences, but with his thick coat he came to no harm. On such

BOMBONNIN WITH HIS FATHER

occasions we had to seize him by his thick neck and drag him away. He is still extremely tame and follows at once when called.

When he entered the great ungulates' enclosure for the first time, not long after his birth, accompanied by his mother, he diverted himself at the outset by lavishing the most impetuous caresses on the savage old dromedary stallion, continually leaping up against his neck and head; and the dromedary, who at other times was a terrible miscreant, patiently tolerated the little creature, which was not even his own offspring. Apart from this the dromedary would allow neither man nor beast to approach him. He did not indeed attack human beings, but avoided them, and kicked with his hind legs if cornered. Together with a dromedary mare and a pair of younger animals, he came from the royal stud of San Rosore, near Pisa. The old stallion was the ruler, the *padrone*, of the ungulates' enclosure. At feeding-time the fodder had to be widely distributed, so that each got his share. In a stiff, awkward gallop, gurgling in sinister tones, with his head close to the ground, the *padrone* would often rush into the midst of the animals at feed and scatter them all. When in a very bad temper he would give chase to the male camel, who fled screaming, and would try to bite his legs.

This dromedary once gave proof of the great vitality and endurance of the camels. He received from the sharp horns of a sika buck a thrust through the ribs which reached the lung, so that a bright bloody foam dripped from the wound. He merely withdrew to a corner of the grotto at the back of the enclosure and

there stood quietly. A keeper went in to him, wishing to attend to the wound; he received such a kick in the chest that he was flung some yards backward. Fortunately, he did not receive the full force of the kick. Next day at feeding-time the dromedary appeared as usual, and the wound healed of itself, without surgical intervention.

The older dromedary mare once bore a young one, but all efforts to induce her to suckle it were fruitless; whereas the female camel accepted her foals without protest. If any one approached her she stamped her feet at them as though demented, and she did the same to the foal, so the little creature had to be brought up on the bottle; and all day long one heard its complaining howls, which might have softened a stone but were maddening to human ears. When later on it was sold and left Rome, the keeper who accompanied it on its journey had continually to thrust a finger into its mouth if he did not wish to hear its "song" all day. Having been thus reared, it remained as tame as a dog. After the first few weeks it was put in a special enclosure, and was given an interesting companion in the shape of a fat-tailed sheep of the Somali breed.

One hot summer day a respectable provincial approached its enclosure, wiping his perspiring face. "Ah, that's the giraffe!" he said. "It is very dangerous. I suppose the ram is there for it to eat." This gentleman paid as little attention to the official name-plates as the Berlin paterfamilias who described the rhinoceros and two goats as mother and young!

Of the other dromedaries, one fell ill during an ab-

normally wet season and was placed in a loose-box in the stable. At first it was feeble and docile, but the more it recovered strength the more it tried to bite every one except its keeper. It was apparently weary of its solitude, and was also afraid of human beings, which had never before approached it so closely.

A very vicious animal was an old dromedary stallion which I found in Rome on my return thither. His name was Gigi, and he had once belonged to a troupe of performing animals. Although he wore a muzzle, he had rashly been purchased. Camels that have to wear muzzles are best killed as incurably vicious. I was told that on making his entry into the gardens he had got two keepers under him, and only the muzzle saved their lives; he had thrown himself upon them with all his might. In the big enclosure he was quieter, but at rutting-time he was extremely dangerous. Whips and sticks and even pitchforks made no impression on Gigi, and with stubborn malignancy he continued to circle round his keeper. On these occasions his tongue hung out sideways, and one heard continually the peculiar grunts which the stallion utters at such times (and more especially at night), and the shrill grinding of his teeth. One night he succeeded in jumping over the door of his run into an adjacent enclosure, in which was a dromedary mare—an expectant mother. The only means of enticing Gigi back to his own enclosure was by putting a halter on the mare and leading her before him. It often alarmed me to see parents lifting their children to feed Gigi over the fence. The public always imagines camels to be harmless! At last, one

Sunday, in the middle of the rutting-season, Gigi died, and we were all glad when this happened. He was the only animal whose death has ever rejoiced me. He had already killed a pony in the circus, and in the gardens he once got a zebra mare off her feet and threw her into the air!

The old camel Moritz, in the Berlin Zoo, was, on the other hand, an excellent animal. In summer the children used to ride on his back, Moritz always behaving with tranquil dignity. It was always amusing to see him on his return to his enclosure in the evening, rejoicing that his day's work was over and looking forward to his supper of hay, hastily crossing the enclosure to his stall with a few elegant leaps.

That dromedaries are often vicious biters, and dangerous, the German troops in German East Africa had reason to know. Many of them received dangerous and even fatal bites from dromedaries; mostly from animals which had broken loose at night and bitten the sleeping soldiers in the neck.

Camels always bite one another in the legs, and on this account kneel when fighting.

In the matter of spitting, however, the llamas are superior to the camels, particularly the wild guanacos. In Hanover there was once a guanaco in the antelope-house, and a board giving warning of his habit bore the not very lucid inscription, *Vorsicht! hier wird gespuckt!*

A male guanaco in the same gardens, which had just arrived and had been turned out into his enclosure, ran straight up to the fence and spat, sad to say, at

his own director, who had come to greet the newcomer and received the unsavory green mouthful full in his face.

In character and intelligence the llama resembles the camel, but is a much more harmless creature. In the Hanover gardens a fine pair of llamas used to draw a chaise in which children took rides, and they are sometimes to be seen in harness at the circus, and also at Hagenbeck's.

A fine spectacle was afforded in the Roman Zoo by two male llamas, who fought every evening—but never in the daytime—without, however, doing one another any damage. They did not merely try to bite each other's legs, like camels, but stood erect, as some deer do when fighting, trying to strike one another with their forefeet, at the same time straining their necks in the endeavor to bite. The sight of their vehement encounters was really fascinating. The battle was often protracted, lasting at all events until the opponents were tired out. They really seemed as though bewitched, for at other times they were, like the camels, obtuse and phlegmatic animals.

Many llamas, more especially when newly imported, but also even after a long sojourn in Europe, die of leucaemia (decomposition of the red blood corpuscles), a malady caused by a blood parasite. Their flesh is then almost white.

Crosses may readily be obtained between all the different varieties of camel, and the offspring are fertile.

More attractive in form and character than the cam-

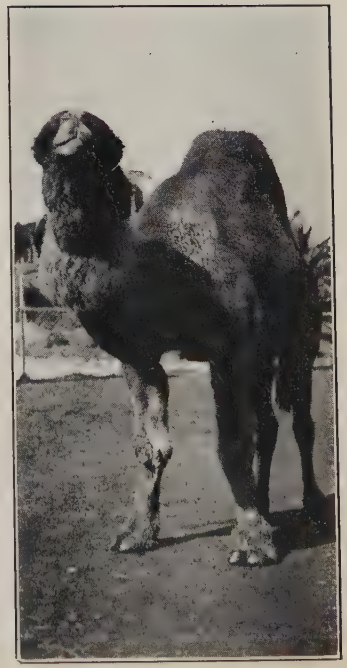
els and llamas are the deer. Next to monkeys and bears, they are the favorites of the visitors to the gardens, and they soon learn to know their public and to beg for food. Deer seldom remain shy. An exception may be made in the case of the little Indian pig-deer, which is often shy in comparison with other deer. In the Hanover gardens I noticed that they never took anything from the hand but stood hopefully waiting a couple of yards from the trellis, so that the food had to be thrown at them. Years ago there was a buck of this species in Hanover who, when he caught sight of the dogs which were kept for rat-killing, was so startled that he sprang clean over a fence nearly seven feet in height and fled; and he actually swam across the lake before he could be recaptured.

As a rule, however, all deer incline to become tame. In the Hanover gardens, once a royal park, the fallow deer come right up to one of the forest paths, halting at the line which the public are forbidden to cross, which is marked only by a few small notice-boards, and allow themselves to be fed. Sometimes they even go as far as the restaurant. They are never in the least aggressive. Roebuck, on the other hand, even when tame, may be very dangerous in the rutting-season. In the same gardens a roebuck which at other times was perfectly tame wounded a child severely and had consequently to be killed.

Our fallow deer in Rome were in general neither tame nor wild. One white stag, however, had always to have his antlers sawn off, as otherwise he was dangerous to other animals. We often bred the porcelain

GIRAFFE
Lisa

DROMEDARY



DROMEDARY
Gigi

fallow deer, always from a sturdy black buck and white does. The young "porcelains" were recognized immediately after birth by their pure white legs and white throat and the white spots on their bright yellow coats. They reminded one of new-born white fallow deer, except that the color of their coat is more like pounded boiled chestnuts than anything else.

A very rare creature is the little Rhodian fallow deer, a genuine insular variety. The most striking feature of its coloring is the jet-black dorsal stripe; the body, especially in the doe, is slender as that of a gazelle; the head is fine and elongated, quite unlike that of the ordinary fallow deer, and the buck is peculiar in the broad spread of his antlers.

These animals were given us by General d'Ameglio, then governor of Rhodes, and were very tame. They had as little fear of the cheetah as of the leopards, Bobby and Lulu. Deer and cats would both go quite close to the dividing trellises, and then the buck would strike out with his forefeet and lower his antlers, and —the beasts of prey would run away! They made as little impression on the deer as did the posturing peacocks.

Many of the sika deer were quite tame. One old buck, however, was very vicious and even attacked the keepers. One day when the keepers were holding his antlers in order to saw them off he dropped dead of excitement and anger. Another buck had to have his antlers sawn off, as he used to attack other animals. It was he who wounded the dromedary in the chest. The antlers of the sika, with their six sharp points,

are a very dangerous weapon; far more dangerous, for example, than the shovel-shaped antlers of the fallow deer.

The pretty Indian axis deer offer the most curious contrasts. The does are thoroughly tame. We had two in Rome, and used to take them out on the lead, like dogs, or let them run loose. They were both old animals, and had been reared by Hagenbeck. The buck was equally tame during the first year, even when wearing his antlers; then his character suddenly changed and he became so vicious that his antlers had to be sawn off. At this time he was sometimes photographed for the cinema in an "Indian" hunting scene. He attacked me once, and although I was holding a door of perhaps an inch in thickness in front of my legs, he pierced it through as though it had been of cardboard. I was at all events able then to hold him fast, in order that his antlers might be sawn through. After this he felt a deadly hatred of me. His attack was more formidable than ever, as I once discovered, for he attacked me one day with his antler stumps, which were of course impossible to hold, nor would he allow himself to be caught by the keepers. My skin was all colors of the rainbow after this encounter. His successor, an imported buck, was at first nervous, but soon became equally vicious, while the offspring of both were timid and anything but vicious. This second rascal fell into the same trap year after year. When he had scoured the velvet off his antlers, the lessee of the neighboring restaurant, who did not, of course, wear uniform but whom he knew very well, as

he saw him daily, teased him until he thrust his antlers through the bars far enough to make it possible to seize and hold them. Thereupon the keepers, who were waiting in concealment, hurried into the enclosure and the buck was soon hornless. Whether he forgot this stratagem from year to year, or whether the excitement of the rutting-season made him regardless of danger, must remain a problem.

It is a remarkable fact, by the way, that no cross-breeding ever occurred among our sika, axis, or fallow deer, although numbers of all these species were kept in the same great enclosure.

One axis buck was kept for some eighteen months with a fallow doe, with no other deer about, but he simply took no notice of her.

The reindeer occupies quite a special position among the deer as being the only species which has become a genuine and serviceable domestic animal. It is at once a draft-animal and a provider of milk, meat, leather, and pelts. In zoological gardens, as a rule, we see only the tame reindeer; the Berlin gardens were the first to import a pair of wild reindeer from Newfoundland. Of all the deer, the tame reindeer is the least graceful and most phlegmatic-looking. In Rome the reindeer were always pitied by all who saw them. People thought they must suffer from the climate; but they suffered as little as the polar bears, and in two successive years they gave birth to young; which were certainly the first reindeer to be born in the Eternal City! They do not suffer at all from the heat, but rather from the protracted and most unpleasant rainy

periods with which Rome is often afflicted. At such times they sometimes contract rheumatic affections; but in other respects their physical condition is improved by their change of habitat. They have plenty of shade as well as sunlight in their enclosure, and cool running water, and do very well without reindeer-moss; indeed, they would far rather eat carrot-tops, crushed oats, a few sliced carrots, and scraps of bread, and they are particularly fond of fresh oak-leaves, also of green mulberry- and robinia-twigs, and of fruit, especially pears.

In the rutting-season the character of male deer often undergoes a fundamental change as a result of strong sexual excitement. During this period an Aristotle stag in Hanover, whose temper was good at other times, attacked his keeper in his stable, trampled over him, and would have used him still more severely had not another keeper, who happened to be passing, driven the infuriated animal off him.

Our red deer and wapiti were not as a rule vicious. Although their enclosure was not very large, they seldom attacked any one. On the other hand, a bull-wapiti, in the rutting-season, wounded his own daughter so severely that the poor creature had to be killed. The lungs were perforated in two places, so that the breath came rattling through the wounds, and one tine of the antlers penetrated the abdominal cavity.

In speaking of red deer I must not forget to mention a particular friend of mine, a stag, in the Hanover gardens, who was known as Hans. In the autumn of 1901 he shed only one of his antlers, and till the

autumn of 1903 he went about with a single antler. Only then did he lose the second. As he too, in the rage of the rutting-season, had killed an adult doe who did not welcome his advances, he spent his days in solitude so long as his single antler so oddly adorned his head. He always came to me at call, even from his lair, or if he were feeding, in order to have his head and neck scratched. It was just the same at rutting-time, except that he then became very unamiable if I —offered him food! He refused everything; he wanted only to be caressed. It was as though he really felt insulted by the offer of food. Hans always knew me again, even after a long absence.

Another stag, who likewise bears the name of Hans, but is a thorough miscreant, is now living in the Roman Zoo. Every year his antlers have to be sawn off, since he is a danger to his keepers as well as to other animals, and every year in his blind fury he allows himself to be lassoed as a preliminary to the operation. If any one goes up to his enclosure he rises up against the fence and tries, with his forefeet, to strike out over it. Even out of the rutting-season he has this impertinent habit. It is really easier and safer to deal with a lion or tiger than with an angry stag. The force of the blows struck by the forefeet was demonstrated by a hind, who was confined in a loose-box while under treatment for a wound in the throat. With one blow she dashed her feet through the planking, which was seven-eighths of an inch in thickness, so that the sides had to be reinforced. Even in her stall this animal was constantly trying to attack

with her forefeet, so that it was advisable when approaching her to employ a thick shutter or door-panel as a shield. The belief so prevalent, that deer and camels are quite harmless, is not shared by those who have practical dealings with these animals.

The giraffe also strikes with its forefeet in self-defense. It is, in captivity, a delicate, foolish and tiresome animal. With its short, sloping body, excessively long neck, little head, big, foolish eyes, and enormously long legs, it is something of a figure of fun. But its very height makes it one of the great attractions of a zoological garden.

In the year 1910 Hagenbeck acquired a fine female giraffe from Gallaland. She proved to belong to quite a new species, which I described in honor of the old Herr Hagenbeck as *Giraffa hagenbecki*. She came to Rome in 1910 with the great transport of animals which was brought over the Brenner Pass for the new zoological gardens. Since a giraffe was something quite new to the Romans, she was the object of immoderate admiration, and all the newspapers were full of her praises. There was not a Roman but knew that her name was Lisa! Lisa was good-tempered and tame, but, like all giraffes, rather uninteresting. Despite her good temper, however, if one approached her too closely from the front she would sometimes strike with her forefeet.

One morning, a few minutes after Lisa had eaten some bananas from her keeper's hand, she was found dead in the stable. No symptoms of illness had been

REINDEER

apparent. The cause of death was cerebral hemorrhage. Few animals in our Zoo were ever so popular. She owed her popularity entirely to the Roman press. The mourning for her death was general; all the newspapers of the capital published an obituary notice. The autopsy revealed atrophy of the lungs; one lobe was contracted to the size of a child's head, while extensive morbid changes were detected in the other lobe. Where Lisa contracted her malady—whether in Africa, on board ship, in Stellingen, or in Rome—it was quite impossible to determine. With their susceptibility to disease and the accidents due to their peculiar build, such as fractures of the spinal column and intestinal lesions, dealers in animals and zoological gardens are only too familiar.

Related to the giraffe and the okapi, but very different in character and intelligence, is the nilgau, which, unlike the giraffe, is often to be seen in zoological gardens. The bucks are always remarkably vicious, and it is often impossible to keep them together with the females. In their enclosure they go about with rounded backs and uplifted muzzles, their tails between their legs—a gait which is horribly disfiguring to an otherwise handsome creature, and conceals its true proportions.

In the royal forest of Castel Porziano, not far from Rome, there are nilgau living in perfect freedom. I do not suppose such a sight is to be seen anywhere else in Europe. A beautiful and surprising picture is that of these Indian animals under the oaks, ilexes, and

pines, gazing expectantly at passing vehicles or pedestrians, and then, with tails pointing to the zenith, ambling or galloping away.

By royal command three adult buck were captured for the zoological gardens. Two died within loose-boxes on the way to Rome, while the third, when released in the gardens, galloped once across the enclosure and suddenly fell dead. Apparently the excitement of his chase, capture, and confinement in a narrow loose-box had been too much for him. It was a great pity; he was a fine creature, and was very much bigger than those in the gardens; a fact that speaks well of climate, soil, and pasture of Castel Porziano.

We then acquired three quite young hinds, a buck and two does, which were reared on the bottle after their foster-mother, a nanny-goat, had no longer milk for them. While the two does remained tame, the buck became vicious after he changed his coat, which he did in his second year.

During their first two years both buck and females were in color a reddish brown, flushed with a faint gray; this, in the case of the buck, turned to a blackish-gray. Another buck, which came from Hagenbeck, had not yet changed color and was tame as a dog; and even when he had changed his coat he remained good-tempered for a long time, and allowed himself to be stroked. Then, suddenly, he began to go down on his knees when approached, swaying his head from side to side, but without actually attacking or coming to close quarters. He seemed to do this half in temper, half in play; but in course of time he became very

aggressive, so that it was not wise to approach him without a whip.

At the present time we have two young does from Castel Porziano, which are being reared on the bottle, that have grown astonishingly, and are tame as dogs. They are now about a year old, but all through the winter they drank eagerly from the bottle. It remains to be seen whether they will still be tame when the bottle is no longer forthcoming.

SOME MORE RUMINANTS

WE have had many very tame antelopes in the gardens; for example, a female springbok, a female reedbuck, a male wood antelope, and a male Harvey's tufted antelope. As is often the case with animals, the smaller of the two, the red tufted antelope, lorded it over the much bigger wood antelope. In human company both were quite tame and liked to have their necks and backs rubbed or scratched; though if one petted the wood antelope too long the tufted antelope would give him a push; he was jealous and wanted to be petted himself. The wood antelope had always to get up if the tufted antelope wanted to usurp the place he had warmed in the straw bedding.

It is delightful to have really tame animals, for the antelopes in the gardens often come to grief through their extreme nervousness. In many collections there are individual antelopes which one no longer dares to leave at liberty, because every fluttering scrap of paper or what not sends them dashing in crazy terror against the fence, possibly breaking their legs or necks. Many an antelope has perished so. It is therefore a real pleasure to possess tame animals, with which nothing of the kind need be feared. In one German collection a zebra was actually killed in this fashion. Startled by another zebra galloping out of its stall into an

LAMAS

adjacent enclosure, it ran against the tightly-stretched netting of the enclosure and fell dead with a broken neck!

Another perfectly tame animal was the gigantic eland bull, Hansi. His great delight was a bushel of oak-twigs. Oak-leaves he loved above all things. Hansi always came at once when his name was called. He liked to be stroked and clapped on the belly or the inside of the forelegs. The eland is of all so-called antelopes the quietest and most phlegmatic and can readily be tamed. In South Africa eland are even employed as draught-animals. Despite their heavy, massive build, they are, like the so-called pachyderms, more agile than they seem. In a certain zoological garden a heavy bull-eland, with only a short run, leaped the seven-foot fence of its enclosure. The eland is certainly one of the last animals of which one would expect such a feat.

The South African gnu, on the other hand, has not been tamed, even by the Boers, who have given it the expressive name of wildebeeste. All adult gnus have a perfect right to this name, even though they may come when called, and allow themselves to be stroked, as did Oscar and Felix, two fine East African gnus in the Belgian gardens—one a white-bearded gnu and one a pale gnu. If one called them they always came springing toward one. But it would not have been advisable to go near them in their enclosures.

In 1900 Schillings brought from Africa, to his estate in the Rhineland, a couple of young white-bearded gnus. At first not only he himself but any stranger

could go up to them without precaution, as we may see from a photograph in his book "With Flashlight and Rifle." Schillings had obtained the animals when quite young and had brought them to the coast in the charge of two cows as foster-mothers. They were so tame that on his estate at Guerzenick, near Düren, they were allowed to run loose when coupled together. Nevertheless, as Schillings tells us, the character of these animals, originally so tame, altered with surprising rapidity. The bull first attacked the keeper, and then tossed Professor Schillings into the air, although the professor was provided with a whip. A strong enclosure had to be built for the bull, and he afterward became so vicious that even a number of men armed with whips, and even the whips themselves, failed to make any impression on him.

Hagenbeck once received a transport of about a dozen young white-tailed gnus—the genuine wildebeeste. They were droll little creatures, no bigger than sheep, with straight horns the length of a finger, which gradually developed their characteristic shape only in the second year. They were continually butting one another, and thronged around their conductor like sheep. They were perfectly tame; but a few years later they had developed in the same manner as Schillings's gnus.

A fine adult pair of the same white-tailed species came from Hagenbeck's to Rome. At Stellingen the bull had already attacked a keeper, who contrary to order had entered his enclosure. In Rome he was at first on good terms with the female, but one day he

attacked her so furiously that she, in her terror, ran against the wire trellis and was caught therein by the points of her long horns. The pair were then parted forever.

Another pair, in Hanover, had likewise to be separated, after the cow had dropped and reared a calf. The birth of a gnu is by no means an every-day event in a zoological garden, partly because the animals have unfortunately to be kept for the most part in solitude, on account of their intractability in a limited enclosure.

However, the Roman bull became especially friendly with me. If when I passed his run I called him by name or snapped my fingers, he would sometimes answer me in his peculiar voice, and always followed me the length of his enclosure in a series of fantastic leaps, his white tail thrown high into the air. As a rule, Hans began this play only when I had almost passed his enclosure. Often he wanted to be coaxed before he would greet me again. In this he was just like the monkeys; which at one moment will greet you, and the next moment will take no notice of you. If I passed him again after a short interval he completely disregarded me.

In one corner of his cage a wooden barrier had been erected, and it became his ambition to break this in two. All day long he would work at it, and this was a good thing; he had something to do and did not feel bored. It was impossible to give him another mate, for he would have ill-treated her as he did the first.

Hans never got anything to eat from me; so our friendship had no material basis. For that matter, it

did not go so far as to lead me to visit him in his own quarters, or I might have found myself sailing through the air. Hans the gnu was not Hansi the eland.

His behavior toward me—and I never saw him behave in a like manner to others—was quite consistent with the well-known droll and playful character of the gnus, as Schillings has so finely described it in writing of the animals in a state of freedom, and as it may be observed any day in the gardens, especially when the animals come running out of their small inner stables into the comparative freedom of their runs. At such times they utter their curious cry, *kui*, and run and leap about like foals.

Another very curious peculiarity of the gnu is the setting of the eyes. In order to see them, especially in the case of the white-tailed gnu, one is literally obliged to stoop. They look directly downward, and their old scientific description of *Catoblepas* excellently describes this peculiarity.

We have, of course, many goats and sheep in the gardens. It will surprise some readers to learn that the ram is as a rule a vicious animal, whereas the he-goat is not. The ram seems a more stupid animal, but for that very reason, perhaps, he is more stubborn and violent.

One of the batteries of a Hanoverian regiment of field artillery had a moorland ram as a mascot, which always accompanied the battery on service and on parade, but would never make way for any one; no, not even for the officers. Once at a roll-call he charged the lieutenant who was calling the roll. The officer was

just able to save himself by a nimble leap into the air, so that the ram charged by underneath him.

Another ram, on the occasion of a marksmen's feast in a small German town, somehow found his way into the banquet-hall and cleared it in a few minutes. Tables and chairs and so forth lay in ruins, and those feasters who did not hastily disappear had a very bad time. Having done his job of work, the ram proceeded on his way.

The vicious temper of the ram is in complete contrast with the shyness of the wild goat and cross-bred goat, and the good temper of most of the domestic varieties. It seems as though rams are altogether more aggressive, and this of course refers also to wild sheep. Some years ago there was at Hagenbeck's a huge newly-imported wild ram from Central Asia which was extraordinarily vicious and had to be handled with the greatest precaution.

Many mouflon rams are extremely vicious, whereas the ewes often become tame. In the Berlin Zoo a mouflon once descended from his rock in one mighty leap, and butted a keeper—it literally "caught him stooping"—so violently that he was flung a distance of several yards; then the ram returned to his rock as quickly as he had come. We had a mouflon ram given us which had not quite attained his final coloring, and was then very tame. Gradually, however, his tameness disappeared and he became most aggressive. One day I accompanied the keeper into the mouflon's enclosure to attend to a new-born lamb. The keeper moved away from me in order to fetch the lamb, when the ram ap-

peared from behind the rocks. He no sooner caught sight of me than he came forward, lowered his head a little, and charged. The whole thing happened in a flash; but when he had nearly reached me I stepped quickly aside, tore off my white straw hat, and struck the ram on the nose with it. Next moment he had disappeared among the rocks. The white object that had suddenly whizzed past his eyes and hit him on the nose, and the fact that he had run against the empty air instead of encountering an obstacle, seemed to have thoroughly startled him.

Here is a prettier scene, in which two sheep are the actors. These were two Somali ewes, of the fat-tailed variety, white, with black heads. They were the last survivors of a small flock which during the journey to Rome had served as food for two lions presented by the Negus Menelik. At first they were together in one of the large enclosures, but then they were parted for more than a year. One became first the companion of the young dromedary, and then of the eland Hansi, who never liked to be alone. When she was finally restored to her companion, their mutual delight at meeting again was touching; they ran round and round each other, continually butted each other, and were inseparable all day. Their mutual recognition had been immediate.

The last great family of the ruminants, the *Bovidae*, is represented in zoological gardens both by wild species and by domestic cattle. Of these the Indian zebus may be seen almost everywhere. They are distinguished for their good-nature and, in comparison with our

SARDINIAN MOUFLON

own domestic cattle, by their greater agility. We could even pare the hoofs of our big zebu bull without incurring the slightest danger, and he willingly allowed us to lash him to the wall when the operation was performed. The cow was rather less confiding, and was unapproachable when her calf was taken from her; the threat of the whip kept her from attacking, but she ran impatiently to and fro. However, she very soon forgot the incident, and only a few hours later she was quite phlegmatic. She was very jealous of other cows which were sent to the bull from the agricultural research station.

The dwarf zebus, on the other hand, were and are still extremely timorous. It was very difficult, for example, to watch them in the enclosure; they rushed about like mad things. Once, when a two-year-old bull, born in the gardens, had to be taken to another enclosure he repeatedly flung himself on the ground, and was only induced to move when a nimble fellow seized him by the horns and tried to wrestle with him. Then he jumped up and ran forward a few yards, only to throw himself down again. Whether it did not please him to be led on a halter—which was held by a man on either side—or whether he was merely frightened, it is difficult to say. Probably he objected to the halter, for he was not used to being led. He never uttered a sound during his removal, nor did any of his late companions. In this respect they are quite unlike our domestic cattle.

A remarkable incident occurred in connection with an African zebu bull. He came from Tripoli, and had

the luck to land in Naples before he could fall a victim, as his companions had fallen, to the butcher's knife. These zebus had provided meat for a convoy of troops during the Tripoli war. From Naples a few survivors were sent to Rome as a present to the municipality, and the municipality presented this bull to the Zoo. In the course of time the animal's hoofs grew too long and had to be cut. The farrier was not able to come but asked us to bring the bull to him; so two keepers, accompanied by the head keeper, led him off to the smithy, which was perhaps half an hour's distance from the gardens. At first the zebu went quite quietly, walking, as it happened, behind a company of infantry; but when this turned off down a side street he suddenly became rebellious, began to leap and run, and insisted on trying to follow the soldiers. One keeper fell; the other, with great difficulty, tied the excited animal to a plane-tree. I had been following in a car and had witnessed the whole scene, and I called out half a dozen stout fellows from a neighboring slaughter-house, and four men walked in front of the bull, holding one rope, and four behind him, holding the other. So we proceeded to the smithy, a distance of two hundred yards. The master farrier, whom I had also summoned, did not seem very willing to operate. He reflected, perhaps, that circumspection is the mother of wisdom. So the eight men had to tackle the bull as best they could. Tied fast fore and aft, he was powerless. For the return to the gardens the big van was ordered, and the bull tied behind it. Then we started. Half the time he went with the van, half the time he

was pulled after it. At all events, we reached home without further incidents.

Although this animal had been fifteen months in the gardens, he evidently remembered his military past the moment he saw the soldiers.

Among our buffaloes we had a fine and powerful Campagna buffalo, jet black with white forehead, and an Abyssinian buffalo cow, presented by the King of Italy. They agreed well together, and were very tame. The bull came to us with a bad name—literally, for he was called Falso, which was quite undeserved, for one could do what one liked with him; the keeper used to ride on his back. The wild buffalo cow, Emo, was almost tamer. She always came at call, and liked to be fed with oak- or acacia-leaves. While she never molested any one who entered her enclosure, she caused some trouble to the workmen who had to carry out certain improvements, but without any real ill-temper. She upset their wheelbarrows, knocked down any brooms or shovels that she found leaning against the wall, or scattered the heaps of earth thrown up by the navvies; she also tried to snuff at the men, or lick their faces. The more or less ill-concealed alarm of the men seemed a further incitement to tease them; for she was only teasing.

While Falso liked to lie in the water on hot days, with only his nose above the surface, Emo never once entered the water! It may be that she was captured when quite young and reared by a domestic cow, and so knew nothing of the swamp life of the wild buffalo. Her extreme tameness, contrasting so strongly with

the vicious temper of the wild buffalo, points to this conclusion. Still, it is curious that the instinct to seek the water, being a natural instinct, should remain dormant in Emo.

It was one of Emo's playful characteristics to ruin everything that was not securely nailed or riveted. She was particularly fond of rolling up the wire netting of her enclosure with her horns, creeping through the narrow opening, and enjoying a meal of grass and leaves in that part of the gardens which had not yet been laid out. Falso, on the other hand, cared nothing for playing truant, and for that matter Emo's improvised exits would have been too small for him. Emo was lured back to her run by a keeper with a bunch of leaves. A gentle tap from time to time encouraged her to mend her pace, for Emo was in no hurry to return, and would quietly stand still wherever she found anything to tempt her.

Years ago there was a tame buffalo in the Hanover gardens which delighted in playing truant. He would simply knock out one or two of the rails round his enclosure, squeeze through the opening, and do a little grazing in the forest. He was almost oftener abroad than at home, but he always returned to his stall of his own accord, and never did any one any harm.

Crosses between bison and domestic cattle are declared by Fals-Fein to be tractable and good workers. As for the pure-bred bison, one cannot really say that it has any affection for man; though in Buffalo Bill's days one might see a herd of bison in the arena

behaving like a flock of sheep. Bison, in the gardens, always remain hand-shy, even though born and reared in captivity. It is pretty to see the bull and the cow galloping and snorting about the enclosure for hours at a time; all their usual apathy seems blown away as though by magic. Bison, by the way, love the shade. This seems inconsistent with their prairie life in North America; but we may confidently regard that mode of life as one imposed by necessity. Before the deforestation of the prairies the bison was a forest-dweller, as was his cousin, the wisent or aurochs, in his European or Caucasian home.

No casualties are known ever to have been caused by the bison in zoological collections. The keepers can cross their enclosures unmolested. Our bison in Rome suffer the presence of keepers and of workmen alike, never troubling them at all, but merely keeping a certain distance. On the other hand, the cow in particular becomes greatly excited if any well-dressed person uses a keeper's gangway near her enclosure; she lowers her head, snorts or grunts, stamps on the ground with both forefeet together, follows the intruder along the fence, and there repeats this unfriendly behavior. Sometimes, but not often, she butts her head against the wire netting. This, in its elasticity, offers too little resistance to make butting worth while; but in other gardens I have seen bison attacking a timber fence with real appreciation. Karl Hagenbeck was the first to employ, even for the big ruminants, a simple fence of wire netting stretched on an iron framework. Such a

fence seems best adapted to the habits of the animal; it gives when pushed, is therefore not worth attacking, and so escapes damage. Emo, who artfully rolled up the netting with her horns, was in this respect a unique exception.

BUFFALO

SOME SMALLER MAMMALS AND SOME MARSUPIALS

OF the rodents in general it cannot be said that they are highly intelligent. Some, like the rabbits and cavies, are harmless and lovable creatures, and being extremely clean are among the favorite pets of children. Squirrels are pretty creatures, and so too are dormice and jerboas, but they, unfortunately, are chiefly nocturnal, no matter how tame they may become.

Nocturnal too are the porcupines, which are still to be found in Europe, in the Tuscan country, to the north of Siena. We often have opportunities of buying these animals in Rome, and are thus able to furnish specimens for the German zoological gardens, in which European porcupines have seldom been seen.

They are not so large as many African varieties, but in comparison with these they seem smaller than they really are, since the black mane is shorter. Since they do a great deal of damage in the maize-fields, they are often caught by the peasants, who bring them to market. The flesh is said to be very tasty.

Porcupines, being true nocturnal animals, either conceal themselves during the day, or lie curled up asleep in a corner, with the spine-covered rump outward. If disturbed they only erect and rattle their spines, so that they do not afford the public much en-

tertainment. For this reason we keep them together with the monkeys. They have to put in an appearance when the monkeys are fed, but having secured their booty they return to their corner to consume it. Porcupines are genuinely omnivorous, and will eat anything, cooked or raw, that is given to the monkeys.

When we have kept porcupines by themselves we have noticed that, unlike hares and rabbits, they drink a great deal of water, even when given an abundance of greenstuff.

They hold aloof from the other animals, and even the monkeys do not annoy them; their spines protect them too well. Even with their keeper, none of our numerous porcupines has been in any way tame or confiding. The porcupine is always the shy, timorous creature of the night, rustling its spines if approached. But if the animals could be caught quite young and reared on the bottle, and accustomed to a diurnal existence, I have no doubt that they could be successfully tamed. The peasants tell me that they have sometimes kept porcupines in their houses, and that they ran loose about the house and took food from the hand, sitting up and begging like a dog. Since they told me this casually, as an ordinary matter of fact, without being questioned, and gave me the impression that they were speaking the truth, I see no reason to doubt their statements.

One day when several boxes containing porcupines had arrived in the gardens, a badly-made box broke and some of the animals escaped. However, they were all easily recaptured with the pole-net, as in the day-

time they ran rather slowly and uncertainly. In the course of the pursuit it was to be noted that none of the animals shot out its spines, nor did they deliberately run against their pursuers. The porcupine is *not* able to shoot out its spines. On being put into the sack employed for carrying recaptured animals our truants lost a good many spines, and others were broken off and left sticking in the sides of the sack. When one of the keepers tried with his knee to give a porcupine a final push into the sack, several of the spines remained sticking into his knee, inflicting very painful wounds.

The skin of the neck, which is covered with harmless bristles, is most insecurely attached. Any attempt to catch hold of the animal by the skin of its neck is useless, for one is left grasping the bristles with the darkly pigmented epidermis from which they develop, while the porcupine, shorn of its mane, with the rose-pink dermal layer laid bare, makes good its escape, without suffering any loss of blood. The effect of this unintentional flaying is extremely startling, I might almost say uncanny. To the animal itself this faculty is most useful, and it suffers no harm, since the epidermis and bristles very soon grow again. On the contrary, it enables the porcupine to escape more readily when surprised by beasts of prey, or gives it time to employ its weapons in the customary fashion, by advancing backward. None of the porcupines attempted to bite when recaptured.

Observation of our porcupines established the fact that these animals, like so many other rodents, are not purely vegetarian feeders. They do not despise meat,

and once, when we turned some tortoises into their new roomy enclosure, each porcupine, in the twinkling of an eye, seized a tortoise between its forefeet and began, with its formidable teeth, to gnaw the shell. The harmless testaceans were of course immediately removed. It is worthy of note that this attack on the tortoises took place in broad daylight, in the middle of the day. We repeatedly found newly-born porcupines minus their heads; or they disappeared altogether, killed and eaten by their fellow-creatures.

Porcupines are terrible fighters among themselves. The animals bite each other with indescribable fury and tenacity. Pieces of skin and flesh are bitten right out. The wounds are inflicted on the legs, or even more frequently on the lower part of the back, over the root of the tail, which is unprotected by the spines. I have often treated animals thus bitten with dermatol. A stick pushed between the erected spines prevents the animal from lowering its spines and wounding the surgeon, who can then treat his patient in safety. Punctures from the spines are extremely painful. The pain of a mere prick in the calf of the leg will persist for days. The epidermal algae adhering to the spines seem to be poisonous in their effect.

Our porcupines regarded one of their number with a quite peculiar hatred. This animal was terribly bitten, and was taken away from the others and completely healed. Several months later I tried to restore him—having kept him in solitude all this time—to his former companions. The attempt was not a success, for the poor beast was immediately attacked by sev-

eral of his comrades, although other newcomers had been unmolested. They pressed against him sideways, with rustling and erected spines, and, darting their heads backward, tried to bite. There was nothing left for it but to sell the animal. Such tenacity of memory is remarkable in this not very intelligent creature.

The *Edentata* are by no means remarkable for their intelligence. One would expect as much from their smooth brain, whose cortex is almost devoid of convolutions. Yet there is something likeable about the *Edentata*. The armadillos are the species most frequently seen in the market. Their brisk movements and their indefatigable jogging gait never fail to interest the spectators, even though they confuse the animals with—tortoises!—as many people do in Rome. We used to keep them in the lemur's cage. There was never any sort of unpleasantness. Armadillos very soon become friendly with human beings, especially with their keeper, losing all fear and allowing themselves to be handled without resistance. The six-banded armadillos in our gardens know exactly when it is their feeding-time. Their favorite dish is one of minced meat, which they are given for supper. They throng round the keeper when he enters the cage, and stand up impatiently scrabbling against his legs. While eating they try to push one another aside, but do not fight with their claws. Even when kept with monkeys they always make sure of their own share. They are thoroughly omnivorous, and in spite of their feeble teeth they will eat hard uncooked maize. All the pushing and thumping of the monkeys leaves them unmoved, ex-

cept that it incites them to press close together and eat more perseveringly.

Our armadillos have more than once had young. It was pretty to see the mother lying on her back to suckle her little ones. Even then she was still very tame and confiding.

Some years ago there was at Hagenbeck's a perfectly tame scaly anteater, from Java, which used to play with one's hand like a puppy, but with astonishing agility, and yet never scratching, in spite of its long, powerful claws.

The little ant-bears, the Tamanduas, are often to be seen in zoological gardens, and are perfectly tame; we had one in Rome that followed like a dog.

A much more impressive animal is the great anteater. I have seen two live great anteaters, and in character they were completely different. The only thing they had in common was their joy in bathing. One, which lived for more than two years in the Hanover Zoo, spent the winters in one of the monkey-cages. The monkeys and he did not attack one another, but he would not let them get at his food. In the summer he lived in a run of his own, and used to be driven across the gardens with a broom to the crane's house, where he used to bathe in one of the basins.

The other anteater I saw in Berlin; and this one was ill-tempered, so that his keeper had always to be on his guard, for the animal would sometimes rise on his hind legs and try to strike at the keeper with the terrible claw of his forefeet.

The kangaroos, by reason of their height, their

movements, and the incubation of their young, are always one of the great attractions in a zoological collection, while so-called "boxing kangaroos" have achieved a certain fame in circuses and on the boards. The truth about their "boxing" is simply this, that the long claws of the forefeet are rendered harmless by enclosing the feet in boxing-gloves. The trainer then boxes with the kangaroo, and the latter responds in the manner of kangaroos, by trying to seize him with its forefeet. Needless to say, a "boxing kangaroo" must be a tame animal and by no means ill-tempered, or it may bring its powerful hind legs into play, snapping them both off the ground simultaneously and striking downward at its opponent's abdomen—when it is, of course, terribly dangerous.

Some years ago a huge gray kangaroo male attacked a keeper in this fashion, and would certainly have inflicted terrible injuries had not an army surgeon succeeded, with the greatest difficulty, in holding the infuriated animal until help arrived. The rescuer's uniform was torn to shreds and he himself was severely scratched.

Here in Rome we had a fine pair of the great gray kangaroos. Both animals were tame; the female would allow one to touch her through the trellis, but was otherwise timid. The male, on the other hand, was afraid of no one. If one called him by his name, Pippo, he at once came forward, often quietly hopping on all fours, but sometimes in long jumps, especially if one had something to give him—fresh twigs of oak or acacia or eucalyptus, or it might be chocolate, of which

Pippo was extremely fond. Having reached the trellis, Pippo drew himself up on his long hind legs, to his full height, which was well over seven feet, and propped himself, leaning a little backward, on his long muscular tail, so that he was supported, like the sacred Pythia, on a sort of tripod. He would then proceed to scratch his breast and throat with the long claws of his forefeet, raking his fur with each foot alternately. The spectacle of Pippo thus employed was always irresistibly comical. One might have thought that he was swarming with fleas; as a matter of fact, this scratching was a sign of suppressed excitement and impatience, which was expressed also by his dilated nostrils. He loved to have any one scratch his neck and chest; he would then lean forward, with his throat pressed against the bars. However, one had always to beware of his claws, as he constantly tried to seize one's hands and arms with his forefeet. If in play one seized his wrists and held them fast, his eyes grew angry, and with nostrils alarmingly dilated he would pull backward, or throw himself with his breast against the trellis. But he never struck out with his hind legs; for he knew very well that he would only hurt his own feet on the wire trellis.

It was another story when one entered his run. Our head keeper, who fears neither man nor devil, as was proved by his rescue of the zebra attacked by a lion, once jumped over the fence into Pippo's enclosure in order to box with him. He had been striking Pippo through the fence, and the kangaroo had seemed anxious to fight. With the words "Let's have a fight,

Pippo!" he sprang over the fence, gripped Pippo by the forelegs, and began to wrestle with him; whereupon Pippo, with rising excitement, tried to reach the man's face and bite. Since the battle was so far indecisive, Pippo had recourse to his most powerful weapons, his hind legs, and kicked with both simultaneously, catching his left hind foot in the keeper's right-hand trousers pocket. Trousers and pants were of course in tatters, and the fight was decided in Pippo's favor. Fortunately, the kick was not delivered with full force, since the keeper had retained his grip of Pippo's forelegs and pressed the upper part of his body against his chest. Pippo was thus unable to throw the upper part of his body backward, as kangaroos are wont to do when kicking.

I noticed that in hot weather Pippo's forelegs and head were often wet. Thinking that he might be wanting to bathe, I had a tank installed for him, some seven feet long, over three feet wide, and nearly three feet in depth. This gave Pippo the greatest delight; for he now bathed every day, more particularly in the early hours of the morning. His mate also bathed: they went right into the water, sat down on their heels, and splashed with their forefeet, or drank. Pippo especially was a passionate lover of the water, and bathing was apparently good for him, since a sort of skin eruption from which he had formerly suffered, especially affecting the inner side of the legs, disappeared when he had the opportunity of bathing. Bathing, in short, seems to be good for the gray kangaroo, but whether kangaroos bathe in the wild state I have not

been able to discover. I have never seen baths provided for them in other zoological gardens.

A pair of great red kangaroos for whom a tank was installed never entered the water. According to Haacke the gray kangaroo frequents the open and possibly well-watered plains, whereas the red kangaroo is found in dry and stony regions. These red kangaroos, though not precisely timid, were always retiring; they would not allow one to stroke them. If one entered their enclosure they always remained at a respectful distance.

When I was a youth in Hanover I used to play daily with a great red kangaroo. I always went into his run, took him every evening into his stable, and there played with him. Fritz—for that was his name—was never rough, and never used his hind legs against me. We used to romp together like a couple of children. If I wanted to go, Fritz would clutch one of my arms with both his forelegs, in order to detain me, and so he would hop beside me to the door.

Unlike the giant kangaroos, the smaller bush kangaroos, of which the males are of a dark reddish color, while the females are considerably lighter, are always very shy. In Rome they were kept in a run which abutted on a path only on one of its shorter sides, and this path was little used by the public. The animals eventually became so shy that two males and a female broke their necks against the trellis, one of the males before my eyes; he fell as though struck by lightning, bleeding from the nose and mouth.

The only surviving female, who was born in the gardens and was carrying a young kangaroo in her pouch,

was now placed in another enclosure. Two sides of this were skirted by paths, one of which was much frequented and was also traversed by trolleys and handcarts. As a general thing a very timid animal is more or less withdrawn from the public gaze; here, on the contrary, it was brought into close contact with the public! The result fully justified the experiment; since then we have lost no more bush kangaroos. The young kangaroo was doing splendidly, and then we discovered that in addition to him his mother had yet another and younger kangaroo in her pouch! The second youngster must already have been born when we moved the mother after the death of the last male. The first-born was a female, who gradually became so tame that when there were not many people about, especially toward the evening, she would readily come to the trellis, stand upright, and take greenstuff from one's hand.

The fact that the female does occasionally carry two young at a time was confirmed by the mate of our giant gray kangaroo, Pippo. The larger of the two youngsters of course spent many hours of the day out of the maternal pouch. But the young still continue to suck even when they have grown too big to get into the pouch, so that their long hind legs have to remain outside—a truly comical sight.

We learned something of the extreme timidity and wildness of the kangaroo one night when a dog found its way into the gardens. Next morning, in the kangaroo's enclosure, two striped kangaroos and a moon kangaroo lay dead with fractured spines. In their

terror at the sight of the dog they had lost their heads and leaped against the trellis.

Of other marsupials we had at one time a pair of broad-headed wombats. On the journey to Rome the male had bitten the female severely; her back was covered with wounds, so on their arrival she was taken from her mate in order to receive special care. Wombats are extremely quarrelsome; it seems that in the wild state they live in solitude and rarely come together save at the mating-season.

The male wombat, on the contrary, arrived in the best of health and was placed in the smallest run of the kangaroo-house. Since this run had merely an earthen floor, the keeper was directed to shut the animal up at night in the cemented inner room. This was early in November of 1910, and the staff, of course, had hardly "shaken down"; so that one night the keeper forgot his instructions, which, considering the pressure of work at that time, with the installing and shifting of the animals and what not, was comprehensible and even excusable. Since the wombat is conspicuously a nocturnal animal, and sleeps most of the day, and is also a masterly excavator, this particular wombat employed the hours of the night in sinking a hole under the foundations and digging a tunnel under the fence of his run. Next morning there was nothing to be seen of him but his track, which was soon lost in the grass. We followed his scent and searched for him with a dog, but our efforts were fruitless; for one thing, the dog was bewildered by the scents of so many different and unfamiliar animals. So the

wombat disappeared. Then, one day in March of the following year, one of the workmen engaged on the buildings for the jubilee exhibition, in the Valle Giulia, not far from the Zoo and the Borghese gardens, came to inform us that the workmen had caught a bear in a ditch and had tied him up by one of his legs. A rescue party at once set out with cords, nets, and packing-case, and found—our wombat, with one leg tied to a stake and angrily snorting. He had not lost flesh; on the contrary, he was round and plump. How he had lived is a riddle, for the months of his vacation are not those of abundant vegetation. That he should have remained unseen, living a nocturnal life, was more comprehensible; he would have lived like the badgers which inhabit the Borghese gardens and are never seen, for at night the gardens are closed and empty.

Our "bear" was brought home in a sack, and was then given a home with a troop of half-grown baboons. The cemented floor of the cage, covered with a thick bed of sand, nipped in the bud any possible thoughts of escape.

The capture of the truant had an amusing sequel. During the morning of the same day two men came to me and expressed a wish to see the "bear." They had caught him. Their wish was granted, whereupon they returned with me to my office, when one of them declared that the animal belonged to him, as he had found it! The laws relating to lost property were apparently quite unknown to his ingenuous mind, and even his companion seemed to think them rather peculiar. The end of the story is, that I rewarded the finder, while

his companion, who intended the wombat to end his wanderings in the frying-pan, I firmly but politely invited to retire unrewarded.

As a matter of fact, the description of the wombat as a "bear" is by no means so absurd as it may sound; for the wombat is reminiscent of a very fat and short-legged bear. However, on closer examination its teeth prove the animal to be a marsupial rodent, living as such; and indeed in its gait, though not in its even coloring, it is more like a gigantic hamster than anything else. Like the hamster, when driven into a corner or annoyed the wombat springs at its opponent and bites, gnashing its jaws. Even our Roman wombat would sometimes lose his otherwise even temper—for example, if the keeper entered the cage with a pail of food and tried to push him back with his foot as he made for the door. On such occasions the thickset and apparently clumsy animal would jump at the keeper in the most unexpected fashion. However, the keeper was protected by his thick leather gaiters. The wombat was most eager for his food when grass or green twigs were served out, but he ate all that the monkeys ate, whether cooked or raw. He soon understood that with monkeys about, and especially baboons, it was necessary to be in his place if he did not wish to go short. Accordingly he had to accustom himself to eat in the daytime, and show himself to the public, who duly admired him and often asked, "Is that a bear?"

At meal-times, accordingly, he took his place, quietly and circumspectly but decidedly, and caused no dis-

turbance to others. But he himself was soon disturbed, for he evidently ate too much to please the baboons. First they began to lift their eyebrows and to chew, in token of their rising excitement; then they thumped on the floor with their hands, drew back, and ran at the wombat with threatening mien, but all in vain; the entire performance left him quite unmoved. Now one would press gently but boldly against the wombat's broad and intellectual forehead, with the only result that now at last he pushed himself well to the fore, spitting a little, and quietly went on eating. The baboons took very good care not to venture too near his teeth, even though they now proceeded, if not to steal the food out of his mouth, at least to snatch it away from under his nose. Then the wombat would lean forward, spitting, but of course without catching the baboons. The scene finally ended in a terrible screeching on the part of the whole baboon community, who bombarded the wombat with sand, while he, still spitting, went on eating, and kicking out, like a donkey, with both hind legs, returned the sand in showers.

The baboons never went so far as to bite the wombat; for where could they attack him through his thick, elastic coat? And his ears and legs are too short to get hold of; moreover, the wombat knows how to bite.

Later on, the wombat was given rather less turbulent companions than the baboons, who in his place received the bear Teetjen. His new comrades were meercats, capuchins, civet cats, a palm-roller, and occasionally porcupines. There were now no more dramatic scenes

at meal-times. At most a big capuchin would sometimes timidly try to push him aside, with as little success as the baboons.

One of the capuchins and the palm-roller were fond of mounting on the wombat's back, just as the monkeys in Hanover used to ride the armadillos. The wombat took such matters very calmly. He was on friendly terms with all the animals, and slept together with monkeys, civet cats, and the palm-roller, the wombat playing the part of a stove or hot-water bottle. When the keeper went to clean the cage the wombat was quiet, unless the man went too near him, when he spat. He apparently did not think fit to enter into more intimate relations with human beings. Possibly the wombat is too stupid ever to be tame.

PART IV

OSTRICHES, EMUS, CASSOWARIES

AMONG the mammals the smaller species are in general the less intelligent. Among the birds the largest species, the ostriches, are the least intelligent. Compare an ostrich with a starling, or a raven, or a gray parrot! A glance at the large and indescribably stupid eye of the ostrich, and the strikingly small head with its tiny brain, will give you a sufficiently just idea of the bird's intelligence.

In the wild state the African and American ostriches are timorous dwellers in the desert or the prairie, the emu roams the Australian bush, the cassowaries inhabit the primeval forests of New Guinea, while the kiwi of New Zealand is a shy and silent creature of the night; yet they all soon become accustomed to captivity. The African ostriches and nandus of the ostrich farms have almost become domesticated. In Europe there are or were such farms in Sicily and Sardinia, near Nice, and in Hagenbeck's *Tierpark*. There are nandu farms in the Argentine.

The African ostrich looks his best and proudest at the courting season, when, turning and bending his neck, he spreads out his magnificent wing-feathers and fans the air with his wings; but all the ostriches look magnificent when in the morning they leave their narrow sleeping-quarters and rush out into their wide

enclosure, racing about with outspread wings, or dancing and gyrating. These birds love movement above all things, and for this reason they need a large enclosure. They are very fond of a sand-bath, but they prefer the water, as one may see on Hagenbeck's ostrich-farm.

To induce ostriches to breed one must keep them in single pairs, undisturbed, in large runs. The two latter conditions are difficult to fulfil in zoological gardens. In Egypt the individual runs are surrounded by high mud walls. In our latitudes the eggs are taken from the birds and hatched in incubators. The periods of incubation, being not less than forty-two days, is too long, in comparison with our short northern summer, for successful breeding in the open air. Moreover, by removing the eggs we obtain a larger number, sometimes forty or more from one hen. Special houses, artificially warmed, are of course provided for the young birds.

On selecting a pair of birds for breeding it may at once be seen whether they are sympathetic. If they are not it is useless to look for chicks, or for anything but constant strife. One must proceed by trial and error. Sometimes a pair will come together while still living in the common enclosure for younger birds and those exploited for their feathers. But the ostrich often entertains such an insuperable aversion for his kind that he has to be kept in solitary confinement. Our Roman pair, however, agreed remarkably well. The cock was decidedly the weaker vessel. True, he would rush at the keeper, hissing, with open beak and outspread plumage; but he soon came to his senses if

YOUNG NANDUS

NANDUS

threatened with a bamboo staff. Of the hen, however, he was really afraid—perhaps because he was an unsatisfactory husband; for there were no offspring of the marriage. The hen was a zealous layer, but her eggs were always infertile. Now and again she would ingenuously lay an egg while *standing* in the outer run, in full view of the public. She expelled it easily enough, without any great ado, and it fell with a smack on the ground. If it was broken, cock and hen were for once united—in eating the egg.

Ostriches are seldom cordial in their relations to men, though one does occasionally come across a tame bird which one may lead by the neck and stroke. They have been ridden, and taught to draw a light trotting-car, but more for amusement than for any serious purpose. The real value of the ostrich lies in its feathers; and the exploitation of the bird for its feathers is wholly desirable and worthy of encouragement, since it may do much to stop the wicked destruction or extermination of so many beautiful birds in the interests of fashion.

An angry ostrich is by no means a despicable opponent, although the bird is not particularly nimble. I remember a case in which a cock bird, attacking its keeper, bent an iron bar at right angles with a single blow of its foot—and the bar was nearly half an inch thick!

Our ostriches in Rome appear to be indifferent to other birds, and even to the peacocks, which fly in and out of their runs. But even the hectoring cock is afraid of an emu hen which is sometimes turned into the

ostriches' enclosure when the runs are being cleaned.

The dull roaring note of the male bird is very remarkable. During its utterance the neck is greatly dilated and flushes to a dark red. This note is heard most frequently at night, as is the incomparably louder roar of the lion and the uncannily loud and ringing laughter of the spotted hyena—a concert which in Rome I hear nightly in all its beauty.

The digestion of the ostrich is proverbial. It can actually tolerate most things, but not quite everything. Too many nails will kill even an ostrich. Less well known is its great resistance to injury. For example, an ostrich caught its throat on a projecting nail and ripped it open from top to bottom. The bird was thrown and its wound washed and stitched; it made a complete recovery.

Its lack of intelligence and its great physical strength make the ostrich a difficult bird to deal with. Its kick is highly dangerous; yet there is one simple means of disarming the ostrich. A number of men holding shutters or doors before them crowd the ostrich into a corner, when one seizes its neck and draws a black stocking over its head—for a white stocking will not completely blind him. The bird is now absolutely helpless and may easily be caged or driven into another enclosure.

The American ostriches or nandus live peacefully together, even in large flocks. We had at one time, in a not very extensive run, four cocks and two hens; later we added to them a young pair bred in the gardens. There was never any squabbling. Once, when

the cheetah, Chechina, came too close to their run they charged down on the common enemy in perfect order of battle, with bristling plumage, outspread wings, and open beaks. It was well for the cheetah that there was a fence between them! In the same manner they drove away prowling cats; but their attitude toward other birds—as, for example, an emu hen and a collared crane, which lived among them for a time—was always extremely peaceable.

For several years in succession we were able to rear nandus. The cocks saw to the business of hatching the eggs, and would even sit on them two or three at a time. Among the African ostriches the cocks and hens relieve one another at the nest; the American hens are more emancipated. They lay the eggs and leave the rest to the cocks. Our nandus used to lay their eggs in a hole in the most unsuitable spot they could find, apparently in the early morning, when no one would come to disturb them, near the fence and without any protection, so that later in the day they would be constantly disturbed by the public; and the eggs, too, would be in danger of being positively drowned during the semi-tropical rainstorms and thunderstorms of Rome. The hole was accordingly filled up with broken stone, which was stamped well down, and a fresh hole was made under a protecting roof, near one of the houses. The eggs already laid were placed in the hole, which was unhesitatingly accepted by the birds, and all the hens then laid their eggs there. The eggs are yellow when laid, but within a few hours they bleach to white. Now and then, of course, eggs were trodden on and sub-

sequently eaten. This was unavoidable when two or three cocks would sit on them simultaneously. We had to keep our eyes open to see when the eggs hatched, and to take the chicks away as quickly as possible, or some one of the flock would seize a cheeping youngster in its beak, walk away with it, and squeeze it to death. The chicks were not very difficult to rear. A frequent cause of death—though not in quite young birds—was a broken leg. A bird so injured had to be killed. How and when they managed to break their legs we could never find out; for at night they were in a covered house, and these accidents happened only in the daytime, when the birds were running about a roomy turfed enclosure.

The young nandus have a pretty, musical, piping note, which they lose when six or eight weeks old. I have kept them in my house for some weeks at a time; they were certainly less troublesome than young lions or otters! They at once began to eat hard-boiled eggs, crusted eggshells, and little pellets of raw meat. As they did not at first understand how to eat out of a saucer, I scattered the food over their bodies, so that they ate off one another's backs. Water was at first given with a spoon, after every meal. When they were hungry they piped with their pretty musical voices. At other times they lay quiet in their big box of hay, walking a little only when we took them out. Then they ran aimlessly and awkwardly to and fro, making no attempt at escape or concealment. After a time they were given cooked rice and chopped clover. They were still tame, but they soon lost their tameness as they grew. I

do not remember ever to have seen a tame adult nandu. At most they would come to meet the keeper when he took them their food; but apparently they are mentally incapable of any more confidential relations.

The feathers of the nandu are of great commercial value.

The nandus are remarkably proof against the vicissitudes of climate, and that they will stand even the cold wet German winter quite well without shelter is now generally recognized. In the Hanover gardens, until Dr. Schäffs became director in 1892, the emus and nandus were kept all the winter in an absurdly overheated house. Hagenbeck keeps even the African ostriches in the open, both summer and winter; they spend the night in covered houses, or rather sheds, whose ventilators are left open day and night. In Rome we never shut the ostriches up at night. Even when the icy *tramontana* is blowing, even when it is raining cats and dogs, the ostriches remain in the open and thoroughly enjoy a drenching. They seem really to love the rain, just as at Hagenbeck's the nandus and emus loved the snow; I have actually seen them sleeping in the snow in the bitter winter nights of Northern Europe, instead of seeking the shelter of the houses with their warm bedding.

We had a pair of emus sent to Rome which subsequently proved to be two cocks. When they came together they greeted one another with kicks, until the air was filled with feathers, and they all but disappeared from sight. They had therefore to be separated. One of them was at first placed with the nandus; the

other, after a time, was put in a small enclosure, without a house attached, so a little shed was erected, with clean straw bedding. This, however, the emu never entered except to eat, his food-trough being placed there in order to accustom him to go under cover. In the wind and rain he would walk about outside, and outside he slept. The house was chiefly of service in comforting lovers of animals who would otherwise have complained of our keeping the bird without shelter from sun and rain.

The other cock agreed well enough with the nandus, but they were forever plucking out his back feathers, and he himself assisted them. So he was taken away from the nandus, and the two emus were placed in adjacent runs. Here they amused themselves all day long by leaping up on either side of the dividing fence and snapping at each other over the top. The missing feathers of the plucked back were replaced at last by feathers of a uniform black—just as the saddle-sores of a horse become covered, after healing, with white hair.

With human beings emus are not actually vicious. If a man runs away from them they will pursue him, but more out of curiosity than in anger. Haacke, in his "Tierleben der Erde," tells of an emu in the Sydney Zoo which contented itself with snatching off the cap of a man who ran away from it.

The plumage of the emu and the cassowary is characteristic and peculiar. From every quill spring two flexible shafts, each of which bears two thin lines of feather—one might almost say of hair.

The emus are monogamous, unlike the ostriches and

nandus. The business of incubation, lasting seventy to eighty days, occupies only the cock, as I was able to observe in Hanover. But in this case, as the eggs were infertile, or from some reason addled, I had at last to take them from him, for the bird was exhausting himself, and the hen ate all his food. Yet she was always very jealous about the clutch, and opposed its removal with such energy that the eggs had to be taken by force —and the kick of any sort of ostrich is a thing to avoid.

In one zoological garden, where a number of different kinds of cassowaries were kept in individual runs, there was one very vicious bird which always attacked the keepers—leaping into the air with bristling feathers and kicking with both legs at once. One day it kicked a keeper who was entering the run, so that he sat down with unpremeditated violence.

In Rome, on the other hand, we had a Bennett's cassowary which from the first was perfectly tame and is so today. She came to us suffering from opacity of the cornea and an eczematous eruption on the naked areas of the head and throat, which are normally of a beautiful violet down. Both affections were cured after some weeks' treatment, and she became a very handsome bird. She lived at first with an American deer, and willingly let the keeper stroke her on entering the enclosure. We could even lead her about the gardens, with or without a stocking over her head. A thick woollen stocking drawn over the head makes even the strongest ostrich so uncertain of himself that he is easily led at will; he walks hesitatingly, groping with

his feet, and has no thought of defending himself, or even of escaping.

This Bennett's cassowary displayed a remarkable dexterity in catching mice, which she promptly swallowed. Very little is known of the life of the cassowary in the wild state; but it seems that it eats not only fruit, insects, and snakes, but also small mammals, and does not disdain the eggs or nestlings of such birds as nest on the ground; in short, it is omnivorous.

I was once able to observe the cassowary in the act of egg-laying, after finding only remnants of new-laid eggs and bits of egg-shell in the enclosure. One day, however, she sat down on the straw bedding of her stall, the body vertical, with ruffled feathers, and for some time trembled as though in pain or feverish. This continued for more than five minutes, when the egg appeared. The bird's praiseworthy intention of eating the egg just born into this sorrowful world was anticipated, and the egg was saved for the museum. It was grass-green in color when laid, and covered with beautiful arabesque markings, but in the course of the day the color deepened to a dark green. The yolk of the cassowary's egg is red rather than yellow, and the white is much scantier than in the egg of the African ostrich. The flavor is superior to that of the ostrich's egg.

The playfulness of all the cassowaries is very pretty to watch. It is enough to plant a bush, or even a dead branch, in the floor of their run. The birds then begin to take, all round the bush, the most curious leaps,

PELICANS

which display their astonishing agility; or they attack it with both feet, as though it were a serious adversary. In this play, which they indulge in at all seasons of the year, so that it has no connection with the nuptial dance, the cassowaries show extraordinary endurance. They will often continue it for hours, and on such occasions there is always a circle of onlookers round their enclosure. Of all the ostriches they are certainly the most enterprising and the most intelligent. The African ostrich has a very slight play-instinct; it will dance on one spot; but the emu and the nandu seem to possess no play-instinct whatever.

The cassowaries love the rain, especially warm rain. Sometimes they play in the rain; sometimes they crouch down like the African ostrich and enjoy a thorough drenching!

Again, like the African ostrich, the cassowaries love bathing. In Rome, unfortunately, water being none too plentiful, they have had no bathing-place installed, and even in other zoological gardens I have seen no baths for ostriches. In the wild state they are said, like the emus, to be good swimmers.

It is interesting to see the Bennett's cassowary living with animals of a different order. First she lived with an American deer, eating out of the same trough, and slept snuggled up against it. Now she lives with a white Arabian nanny-goat. The goat is a more lively companion than the little deer, and is never tired of romping and playing with the cassowary. Sham attacks are delivered on either side; there are flights and

pursuits, and then the two creatures will dance together. It is such a beautiful and interesting performance that one never wearies of watching it. This friendship has no erotic basis, for both bird and goat are of the female sex.

PEACOCKS, HERONS, FLAMINGOS, AND OTHERS

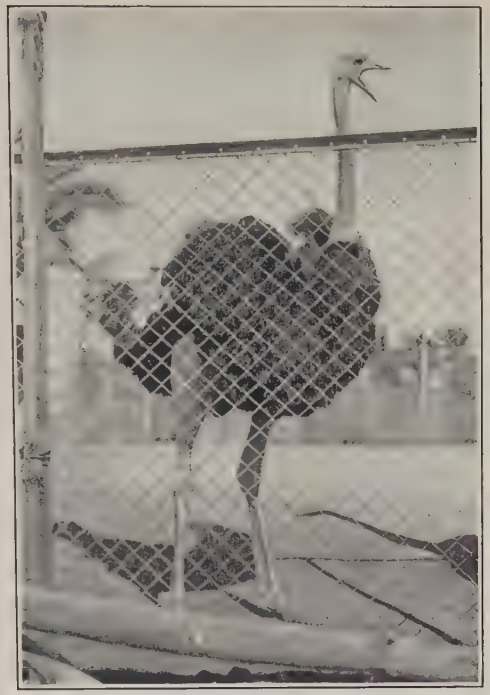
IN our Roman Zoo the pheasants and peacocks enjoy unrestricted liberty. Our first five peacocks were presented to the gardens by the municipality of Rome, for they were sorely damaging the municipal flower-beds. They were placed at first in one of the runs of the ostrich-house, after the flight-feathers of one wing had been removed, in order to get them accustomed to the gardens. However, the feathers grew again, and some of the peacocks returned to their old haunts. They were brought back again, and now all were placed in the giraffe's enclosure, with its high fence, again after the removal of the primaries of one wing. When the feather had grown once more the birds were again set free, but they did not fly away any more; they always came back to their food-trough, and slept on the high fence of the giraffe's enclosure. On the other hand, some of the peahens afterward presented to us did not become accustomed to their new home, though a few additional young peacocks settled down without protest, and all the peacocks in the neighborhood paid us visits. One of them, who came from a convent and was easily recognized by his copper-colored tail, was incautious enough, when a newcomer, to fly into the lions' grotto. The only evidence of a visit, which was disastrous from his point of view,

was the original sort of visiting-card which he left behind him—his tail.

On more than one occasion the peacocks were "moved on" by the cheetah, Chechina; and one could hear their peculiar quavering cries of alarm. Often, too, and especially at any loud noise, they uttered the well-known unmusical cry of the peacock, and also a third peculiar creaking cry, not so loud, which always accurately foretold rain or thunder. As a weather-prophet the peacock is decidedly preferable to the tree-frog; its peculiar cry is never deceptive; rain or thunder always follows shortly.

When there are many visitors in the gardens the peacocks keep to the lawns or the enclosures, or out-of-the-way places where they know the public cannot follow them. The animals, including even the more timid deer, are not in any way disturbed by their presence. They go into all the enclosures and even to the pond in search of food, and spend the night, even in storm and rain, high up in the trees; just as one sees them on the peacock's island at Potsdam. In the foliage of an oak or ilex, however, they are not easy to distinguish; often their presence is first betrayed by their cry. In the mating-season they are generally bolder. A peacock displaying his tail will scarcely move out of one's way. When they were still living in the giraffe's enclosure they were fond of parading before the Rhodian fallow deer, on which, however, their wonderful display of color made little impression. Nevertheless, they agreed very well together.

It is interesting to see how, in the twilight, the pea-



OSTRICH
Ready to attack

RED PELICAN
Behind—an Australian pelican and two white storks

cocks gradually assemble on the grass beneath their roosting-trees, and then fly up into the branches. Most of them spend the night on the boughs of a medium-sized oak-tree, a few large peacocks going to other neighboring trees; but all of them roost in the oaks. In rainy weather particularly the cock birds find it difficult to fly up into the branches with their long wet tails, which then look almost like rats' tails. At nesting-time some of the hens will be absent; for they nest on flat roofs, or in the bushes, and especially inside the enclosures, and are quite unnoticed, until one day a hen comes forward with her chicks. Then, of course, the family are put in a safe place, in order to protect the chicks from rats and weasels and the like. Only when the young birds are as big as a domestic fowl do we let them go free, and it is then interesting to see how they run to and fro, anxiously cheeping, before they venture for the first time to fly up and follow their mother into the roosting-tree.

While peahens commonly nest on the ground, in our gardens they have repeatedly nested in the oak-trees, and in particular on the broad roots of the boughs. On one occasion the mother of a brood of six threw three of her chicks out of the tree and followed them herself, while the remaining three timidly flew after her. All came to earth unhurt and were easily caught and placed in safety, together with their mother, who followed her offspring.

A very different bird, but as proud and handsome in its way, is the crane. In contact with human beings cranes incline to tameness. I have often had young

European cranes in my care, which, as long as they were still in the brown plumage of early youth, ran after me like dogs, continually chirping for food, which they took most readily from my hand. One could take them up and stroke them to one's heart's content. Later, when they were taken to the pond, they got out of hand, being no longer in constant contact with humanity, and their tameness disappeared. But when I was a schoolboy I saw on Count Wedel's estate, at Loga, near Seer, in Austria, a tame crane which with great dignity watched over the poultry in the farmyard, keeping them in order as a sheep-dog does his flock.

One never sees the cranes oppressing or hitting their weaker cage-mates, as herons, marabous, and sometimes even storks and swans will do. The crane's greatest pleasure is to probe the turf or the soil for worms and larvae, much as the starlings do. With this end in view our Roman cranes, although their wings were clipped, were forever leaping over the rather low fence of their enclosure and roaming at liberty about the lawns. Yet they always returned of their own accord. For cranes, as for certain geese, a big meadow would be the best thing; water is of secondary importance. In zoological gardens, unfortunately, there is usually a lack of space. There is, however, a beautiful meadow for the cranes and storks in the Frankfort-on-Main zoological gardens, and we now have one in Rome. Our cranes seldom bathe. Curiously enough, one was found dead in the water, which is only about two feet in depth.

It is pretty to watch the graceful nuptial dances of

the cranes. They step forward with a sort of goose-step, dance a little before one another, run away, return, and begin the game over again, curtseying and courting one another with a lifting of wings, and emitting the clear, joyous, trumpet-like tones which may be heard not only then but all through the night, and which also serve as a signal. In this amorous play each species of crane keeps strictly to itself. This may be plainly seen in Rome, where European, Manchurian, white-necked, collared, Indian, and other cranes are kept together.

Cranes learn clearly to distinguish persons, and greet those they know with joyous trumpet-notes. We can describe them in general as birds friendly to man.

The ibis is another pretty and peaceable bird. The sacred ibis, white with naked black head and neck and black legs, gives less an impression of sanctity than one of a certain quiet distinction. "The race of ibises belongs to the ancient nobility," said an acquaintance of mine; not without justification. The ibis was known and valued long before the time of the Pharaohs.

An ibis in the Hanover gardens once broke a leg. Not for a moment did it lose its innate tranquillity. It stood in dignified immobility on one leg until the other, cased in elder-wood splints, had set, and then strutted about as though nothing were amiss.

To tell the truth, there are spots on its sanctity, for the moral principles of the ibis family are distinctly lax. One would observe this in the Berlin waterfowl cage, where a Chinese ibis contracted an illicit union with a somewhat plebeian cousin, a Japanese spoonbill,

once incorrectly known as the spoonbill heron. Later many such unions were contracted, and bastards in the second and third degree resulted. These facts prove among other things that the spoonbill was quite improperly regarded as a heron. It is simply an ibis with a spoon-shaped bill.

It is interesting to watch the ibises at the work of nest-building—how they often uneasily drag their nest, of twigs loosely put together, from one corner of the cage to another, apparently never finding the right place.

Storks of all kinds do well in captivity and live long. Very curious is the relation of the white stork to mankind, on whose houses it builds its nest, and there breeds generation after generation. In Russia, however, the white storks build in the trees, but still always near human dwellings. On the other hand, the black stork—now so rare, alas! in Germany—is rightly described as the wood-stork.

In zoological gardens the storks are often shy, but always harmless to mankind. They sometimes fight among themselves; but to man the stork is dangerous only when driven into a corner and threatened with capture. Then he strikes at the face, and especially at the eyes, as surely as a heron or a marabou. If one has to catch one of these birds, the best plan is to do it with averted face, feeling behind one's back, so as to seize the cornered bird as far up the neck as possible, and then, with the left hand, to get a firm grasp of the dangerous bill, and with the right to hold the wings, which may otherwise deal an unpleasant blow.

MARABOUS

Tame storks, the majority of which have fallen out of the nest when young and been reared in captivity, are often to be seen in the country, where, like the cranes, they dutifully watch over the poultry.

It is worth noting that in the zoological gardens of Frankfort-on-Main even those storks whose wings have been clipped nest in the stork's meadow. A tree-stump some five feet in height serves as the foundation of the nest.

This shows that storks can adapt themselves to circumstances if only they have access to their beloved meadows.

If storks are kept in captivity with other fish-eating birds care must be taken at feeding-time that they obtain their share, for they always hold back, timidly, while cranes, ducks, gulls, and marabous push to the front, although the first two are not strictly fish-eaters at all.

There was once in the Hanover gardens a black-backed gull which tyrannized over a whole pond, and chased a stork until the latter broke its right wing by dashing against the surrounding trellis. The bone of the wing was completely shattered, so that healing was impossible. The entire wing was therefore amputated and the stump disinfected and bound up. The one-winged stork survived for many years, and the shoulder-feathers of the right side grew so long that those who were unaware of the accident hardly noticed that the right wing was missing. Since the arteries were tied, the stork lost hardly any blood during the operation, and behaved exceedingly well; he only trembled

a little with fear, and of course with pain, despite the use of analgesics.

Much has been written of the stork's courts of justice, which it is their custom to hold at the autumn mustering, before the journey to the south. They end with the slaughter of sick or weakly birds. There can of course be no question of the "moral" deficiencies of the birds thus put to death. As other animals instinctively kill their sick comrades, when these do not leave the community of their own accord, so do the storks, who even in captivity kill their sick or weakly fellows with strokes of their bills. Sick or weakly birds would be burdensome to the storks on their long and exhausting journey, which often leads them as far south as Cape Town. Very old elephants, giraffes, and gnus leave their companions of their own accord, and live as solitaries, as Schillings was able to observe. Old lions, leaving the pack, become man-eaters, for the hunting of men is kinder to their stiff old joints, and promises them more than the chase of the fleet-footed antelope. Wolves, however, are known simply to kill and eat old or invalid members of the pack, just as certain South Sea Islanders eat their old people and their dead! Nature is inexorably cruel, and must be so in the interests of the species. Among the animals and the primitive peoples the struggle for life, for a place in the sun, is incessant. Among the civilized peoples the tension relieves itself by a few and therefore terrible wars, which doom whole nations to destruction as unfit.

Love and cruelty are the two ruling and opposite powers of nature. Which will overcome the other?

Of the great saddle-headed stork, the jabiru, there used to be a very tame specimen in the Hanover gardens. This bird had for a long while been in private hands and was consequently tame and tractable as a dog. He took fish from one's hand, allowed himself to be caressed, and was fond of whispering in one's ear. Our jabirus in Rome, however, were wild and timid, and despite their enormous bills, never violent to other birds. At feeding-time one had to see that they got their share. Even the little ducks would snatch the smaller fish from under their very bills.

Very different birds are the marabous, who always contrive to get their share, and are very dexterous in snapping up the fish thrown to them. They will even attack smaller birds in the most deliberate manner. On account of their character one cannot very well keep them in a common enclosure. In Rome a keeper had always to keep an eye on the marabous when the big pond was cleaned, to prevent their playing any foolish, or rather vicious, tricks. The young ducks were very fond of dabbling in the mud that remained on the cement floor of the pond, and the marabous went after them, striking with their bills at the poor little birds, which, with their short legs, could not make much headway in the mud, and killing them, thereupon stalking away with their poor little muddy bodies, and finally devouring them. Marabous are best kept in a separate enclosure; but even then accidents will occur from time to time.

There lived for many years in the Hanover gardens —from the eighties well into the present century—a

solitary marabou. The children called him "Grandfather"; his keeper, "The Senator." And he was really rather like a Hamburg senator in his official costume, with very thin legs in knee-breeches, especially when one looked at the curious figure, with its indrawn neck and ruff, from behind. He spent his days apparently in stoical tranquillity; but only apparently. As the naturalist Busch remarks: "The body is apparently at rest, but the mind is awake." This marabou's mind was certainly awake. In the next enclosure all the young ducklings were wont to spend the first month of their existence; and woe to one of the tiny creatures if, dabbling its beak in the mud, it ventured its head beneath the dividing trellis! In an instant its head was seized, it was dragged through under the fence, and disappeared into the Senator's crop. If the attempt was not quite successful, which was more frequently the case with larger birds, at least half the upper mandible would find its way down the Senator's gullet. However, many a little duck lived on quite comfortably with half an upper mandible, and grew round and plump.

In order to protect visitors from the noble Senator a guard-rail was fixed outside the fence, since the bird was forever striking at the faces of his admirers—as marabous in general are fond of doing if one approaches them too closely in their enclosure. One of our own marabous, although he really had plenty of room on the long, wide bank of his pond, where no one could possibly incommode him, actually once ran up to

the five-foot fence for the purpose of reaching over it and stabbing at a child's hat!

Yet the Hanoverian Senator was a bosom friend of his keeper's. In his friendship he revealed, for several decades, the pleasanter side of his otherwise rather sinister character. With graceful leaps and lifted wings he always greeted his keeper's entry. It was as though he had suddenly come to life. With loving and painstaking thoroughness he searched all of his keeper's pockets for possible contraband. He loved his keeper to scratch his hoary, or rather downy, head, or to put his arm around him and whisper flattering things into his ear. Finally he lowered his intellectual head to the ground and clattered his beak very gently as though in answer. Just when the old fellow entered the gardens I do not know, but I do know that he lived there for some decades.

That marabous readily become attached to men has been stated by many African travelers; among others, by the late Major Meeker, the author of a celebrated work on the Masai, and by Schillings, who presented a perfectly tame marabou to the Berlin gardens. Whenever he visited the gardens the bird greeted him with the greatest delight, just as the Senator used to greet his keeper. Yet the bird was caught when adult. Schillings kept several other marabous in his camp, all caught when full grown and all quite at liberty. They all caressed him with their beaks, and were fond of cautiously probing his hair and his ears. They never attempted to escape, and even built their nests in the

camp. When he returned to his tent they greeted him by clattering their beaks. Yet it cost a hard struggle to tame them, as Schillings has told us in his wonderful book. For weeks, indeed for months, he had to stuff their meat into their throats before they would eat of their own accord. He fed them with his own hands in order finally to win their friendship and overcome their fear and mistrust. Schillings calls the marabous "birds whose cleverness and capacity for attachment to human beings can scarcely be described."

A complete contrast to the friendly marabou is the heron.

But even herons do sometimes become attached to man. Shy as they are in the wild state, because so greatly persecuted, herons lose their timidity when captive, especially if taken young; they are then, according to Dr. Heinrich, far tamer than the storks. Years ago in Altona I saw a large number of tame herons; they were in the garden of the late burgomaster. They had as companions some equally tame storks. In Berlin both gray herons and night-herons breed every year in the great open-air aviary; and in other zoological gardens, too, the night-herons build their nests of twigs and rear their young in leafless trees, quite close to the trellis and under the eyes of the public; and this in quite small and simply-equipped cages. The progeny of the night-heron are so numerous that it is difficult to dispose of them, so that in some gardens they are killed. But why not release them, so that Germany may have her quota of these handsome

birds? At present they breed in Holland, but not in Germany.

Would they destroy our fish? When there are plenty of fish and the conditions are favorable to them, fish-eating birds have never yet exterminated them. Think of the wealth, the superfluity of fish, and of their enemies too, in unsettled countries!

In the zoological gardens of Frankfort-on-Main even the wild herons have settled down and built their nests in the tall trees near the restaurant. They obtain their food partly in the gardens, partly from the Main. This herony is, next to the cranes' and storks' meadow and the rich collection of marsupials, one of the great sights of the gardens.

Among the other waterfowl the heron is distinctly malicious. His every step is slow and deliberate; but if any harmless and unsuspecting duck or goose should come his way, and a chance occurs of chastising it from behind, the heron is in his element. He has three qualities—or defects: cunning, fraud, and cowardice. You may read them in his green, false, wary eye. All herons are particularly dangerous when confined in traveling-cages. They will lunge with terrible force at the face of any one who goes too near them, so that one should always be on one's guard to protect one's face, and particularly the eyes. The heron lunges out of fear and in self-defense, as the narrow cage prevents him from escaping.

The beautifully-colored flamingos, on the other hand, are perfectly harmless birds. In northern countries it is

impossible to gain any true conception of their beauty, for in cold climates their coloring is too pale. In Rome they are a true rose-pink. Here, too, they are remarkably fond of bathing, whereas in Germany I never saw them bathe; there they only waded in the shallow water at the edge of their pond. In captivity they become quite trustful, losing the extreme timidity which they display in the wild state, but they never grow really tame, as cranes and marabous and other storks will do. With their curiously-shaped bills they are defenseless creatures; they are also good-tempered in their relations with the other waterfowl. They become really lively only at nightfall. Then you may hear their curiously ugly voices, and watch them doing the goose-step in long, dignified, springy strides, or flapping their wings with cries of triumph and skimming the surface of the pond.

In Rome we have sometimes had a glimpse of wild flamingos, which had come perhaps from Sicily or Sardinia. They always circled for a long time, trumpeting, high in the air, over the pond in which their flightless comrades dwelt. The flying flamingo is a curious spectacle, with its long outstretched legs and its comparatively small wings. Haacke justly compares it to a flying cross.

Flamingos are on the whole one of the most singular figures in the avian world. Notwithstanding the long, stilt-like legs and the long neck, the body is very small and light. The neck bends so sharply that one can easily count the vertebrae. They are very sensitive to physical pain, and in northern countries must be pro-

FLAMINGOS

tected from frost in winter. Since they do not lie down to rest, but sleep standing on one leg, there is always the danger that the supporting leg might be frozen. Pelicans, on the other hand, which inhabit the same latitudes, are able to withstand the northern winters, even though they often shiver with the cold. They sleep lying down, with their feet under their warm bellies.

DUCKS, PELICANS, AND PENGUINS

OF ducks and geese we have so many in our gardens that space fails me to describe them all. But I should like to say something of the bird which is, for us Europeans, the primitive type of the duck, the duck pure and simple, so to speak—the wild duck, the well-known *Anas boscas L.* Of late years this bird has largely modified its habits, as many other birds have done—for example, the blackbird, which is more and more becoming a dweller in urban parks and gardens. To-day the wild duck may be seen even on the ponds and streams of a capital city. In the Berlin zoological gardens, for example, one may often see a wild duck fearlessly preceding her ducklings, and accepting food from visitors, or, with tranquil dignity, crossing the wide asphalted causeway with her whole cheeping brood, emitting from time to time a short and encouraging quack. Carriages, motor-cars, and trams are then compelled to halt—sometimes at a sign from a policeman—until the respected family has crossed the road in safety. The Berliners, who are great lovers of animals, do not in general realize that these are genuine wild ducks, which have grown so tame simply because they are not persecuted and are constantly in contact with humanity. They are often taken to be the domestic ducks, the property of the staff of the gardens. The drakes keep rather to the Spree, where

great flocks of them may often be seen, or to the center of the city and the neighborhood of the royal palace, where many people feed them from the various bridges. The reason why these ducks have invaded the city may be found in the progressive draining of small ponds and marshes, and the canalization of streams and rivers.

In its courtship the drake is prone to violence. The domestic duck is no exception. In a certain zoological garden several Rouen ducks were actually crushed to death by the amorous drakes, who were, it is true, in the majority.

The pelicans are amusing birds, if only by reason of their manner of catching and swallowing fish—of which they often swallow so many that the work has to be done all over again; for they come back, and the pelican's joy is doubled.

Despite the respectable appearance of the pelicans, they cannot be trusted if there are ducklings or goslings on the pond. For swans they have a due respect; but ducklings, in particular, disappear like a flash between their mandibles.

In other respects the pelican is thoroughly phlegmatic, and on land its gait is awkward. The pelicans are really lively only when their food appears.

They are as a rule anything but willing to make way for human beings. Confronting man or beast or bird, they open their gigantic bills in a threatening manner, emitting a curious growl. Sometimes they will lunge and snap at the offender, finally retreating with comically long strides.

In the wild state the pelican is a very shy and watchful bird; but it quickly and readily becomes accustomed to human beings. Some ten years ago I saw a very tame pelican in Berlin; it was one of the small South American brown pelicans, a young bird, which followed its keeper everywhere with its comical waddling gait.

In Rome we had a common pelican and a pair of Australian spectacled pelicans. They were not in the least shy, and kept always together, even when love awakened in the rosy pelican's breast. For hours on end they swam quietly as usual round the pond; first the female Australian pelican, then the big male rosy pelican, and then, after a respectable interval, the male Australian bird, the lawful spouse. The big, fine rosy pelican had found favor in the eyes of the Australian beauty, and her lawful mate had perforce to submit. That he still protested his rights was shown by his indefatigable pursuit of the two abandoned birds. This common pelican had one morning a most peculiar adventure. In the autumn a number of moorfowl and tame divers invaded the pond. One day the pelican swallowed a live diver, which had not yet realized the danger, or the capacity, of a pelican's bill. His sufferings, however, were not prolonged. He cannot, of course, have been comfortable inside, and doubtless expressed his feelings by scratching and biting. At all events, he reappeared post-haste, unhurt, and lively as ever. However, he felt the inhospitable spot that very day, knowing more about the pelican's manners than when he arrived. The pelican himself turned over a new leaf; he never again meddled with a moorhen or

YOUNG AND OLD KING PENGUINS
The young birds in their fur coats

a dabchick. Such birds make too big and uncomfortable a mouthful, and as he may well have reflected, *ultra posse nemo obligatur.*

The pelican is not exclusively a fish-eater; for, as we have seen, it devours young ducks and other birds, and also rats and mice, and scraps of meat, and in many small menageries has to content itself with macaroni, while its pond is represented by a bucket of water; and so the quiet, phlegmatic bird lives year after year, waking up a little only at meal-times. The pelican cannot be called over-enterprising. We have only one reproach to make to the bird—it has never presented us with any offspring in captivity.

The cormorant, on the other hand, is like a sort of feathered marten. Its whole bearing, like that of the herons, gives one the impression of a creature always on the watch. The bird that seems to sit so stupidly on its rock is, as a matter of fact, always awake, always on the alert for something to snap up, or looking for the keeper with its longed-for meal of fish. Much more sprightly than the pelican, it dashes at its food, catching the fish thrown to it with amazing dexterity, and often swallowing a fish so large that you would think it must surely choke.

The cormorants are also most skilful divers in pursuit of fish. As great fish-eaters they are regarded as highly detrimental to our fisheries and are therefore greatly persecuted. In the zoological gardens they sometimes give an even less desirable proof of their capacity. In Hanover the cormorants were kept in a large enclosure for waterfowl, containing a pond on

which ducklings and goslings ventured under their mothers' escort. Strangely enough, the ducklings and goslings quickly began to grow less and less. Suspicion fastened itself upon the rats, always plentiful in zoological gardens, until a keeper caught a cormorant in the very act of pitilessly swallowing down a kicking and writhing duckling. As a consequence of this wicked deed the cormorants were of course condemned to solitary confinement.

Another wicked pastime of the cormorants which I observed in Hanover was to catch and eat the swallows that skimmed the surface of the water. The swallows seemed to have no conception of their danger. They did not avoid the pond, but went on allowing the predatory monsters to catch them.

Cormorants readily become accustomed to mankind, and can even be profitably trained to catch fish, as the Chinese have long known, and trained cormorants are sometimes exhibited in menageries. They are mentally alert and cunning, and although wherever they are persecuted they are shy and difficult to kill, they lose their wildness in captivity, where they feel themselves to be secure. They are intolerant of other birds, and are courageous in attack. Like the herons, they try to lunge with the bill.

Penguins—at all events the spectacled penguin—may often be seen to-day in zoological gardens. These birds make friends with their keepers with extraordinary rapidity. They have a conspicuous fondness for holes in the rock, or other cover, and will sometimes remain hidden for hours, punctually waddling for-

ward at feeding-time. In the Hanover gardens there was a spectacled penguin which used to stand like a watchdog in the doorway of its little hut. All penguins, as is well known, are incapable of flight. They inhabit the South Polar zone, and are found also on the west coast of South America as far north as the Galapagos Islands. Even these trusting birds have already suffered much persecution.

They are, as Professor Matschie calls them, birds with fins; anatomically the wings are completely transformed into paddles. The plumage, though it has a scaly appearance, is nevertheless soft and thick, and the white of the breast is glossy as satin. There used to be great numbers of them in Hagenbeck's *Tierpark*, both at the seal's pool, and at a special pool of their own, where there were many small holes in the bank. When they came waddling forward in long rows, often walking two by two, they looked always irresistibly comical; as a friend remarked, "Exactly like a girls' school!"

Later, in 1910, these birds nested in the ledges of the rocks and reared their young; but the young birds, and even the nesting adults, concealed themselves so carefully that no one could detect them who was not aware of their presence. When the young birds at last appeared, the upper parts of the body were bluish-gray and the under parts white, without the markings of the adult.

In 1910, in company with the sea-elephants, some thirty penguins of a very rare species came to Hagenbeck's *Tierpark*. These were king-penguins (*Apte-*

nodytes pennanti Forst) and white-faced penguins (*Pygoscelis papua Bonap.*). It was thirty years since king-penguins had been brought to Europe; while the white-faced penguin had apparently never before reached Europe alive. In size and general appearance these birds resemble the spectacled penguin (*Sphcniscus demersus L.*), but are a slaty gray on the back, and on the belly a uniform white, while the lateral and facial stripes of the spectacled penguin are missing. The feet of the younger birds are yellow, while those of the adults are pink; the wings are bordered with white. The king-penguin, on the other hand, is a very striking bird. Its height ranges up to thirty-nine or forty inches, and its plumage is brightly colored. The back is blue-gray, the breast pure white, with a satiny gloss. The face and throat are black, but the coloring of the throat merges into a dark green where it is mingled with yellow. The neighborhood of the ear is a bright yellow, and from this a narrow stripe runs to the throat, when it passes into the white of the breast, making, with the black of the throat, a dark green. The long sharp bill, slightly curved, is a conspicuous feature. The lower mandible is rosy red, the upper black. The young birds are strange little creatures. They wear a thick, wide, dark brown furry coat—one cannot call it plumage. The bill is uniformly black. As the young bird advances, with dignified gait, it looks just like a fat chauffeur in a thick fur coat. The young penguin chirps like other young birds, but the adult has a blaring, trumpet-like note, which is the more remarkable as the spectacled penguin and white-faced pen-

BENNETT'S CASSOWARY

TURKISH OR MUSKY DUCK
Drake

guins do not utter a sound. The eyes of the young bird are a grayish-brown, not very different from those of the adult. The pupil of the penguin's eye is peculiar: while in the evening it is circular, in the morning and afternoon it is four-cornered and smaller than in the evening. In captivity the erect and dignified gait, which has a particularly comical effect in the young birds, with their thick brown fur coats, always affords much amusement to the beholders, especially when a whole company of these extremely sociable birds comes marching forward. The tameness of the birds, once they have settled down, is very attractive, and their curiosity is most amusing. Like all fish-eaters, they are always hungry. So that every bird should receive his due share of food, a little trellised enclosure with two doors was erected, in which the insatiable birds were given their rations twice a day. The bird whose turn it was walked in through one door and out through the other. On either side stood those that had already eaten and those that were waiting to be fed, looking up, and every time the door opened there would be a scrimmage to enter. This method of feeding the birds takes a good deal of time, but it is a great attraction to visitors.

The birds stood the long voyage across the Equator very well, apart from a few losses. By permission of the captain, part of the deck was partitioned off for them.

The moulting of the young penguin is a very rapid process, and with the moulting the voice changes. Moulting begins always on the breast and head. Un-

der the brown downy coat, which falls off in masses, the white glossy breast-feathers have already grown, and are now revealed. The downy or rather furry coat can be simply pulled away by hand without hurting the bird. It is a remarkable fact that whereas in other birds the wing-feathers, or some other definite groups of feathers, develop while the young bird is still half covered with down, the young king-penguin sheds its brown coat as a reptile sheds its skin, though it takes a few days to do so, and appears in complete and perfect adult costume. Even the lower mandible is rosy, though still a little pale, and apart from this there is nothing to distinguish it from the old birds, nor is there anything in its outward appearance by which its sex can be determined.

The penguins arrived in Stellingen in June or early in July, and had been about five weeks on the voyage; but it was several weeks after their arrival that the brown woolly bundles—as big as the old birds and looking even fatter in their downy coats—began to moult. If we take it that when caught they were at least two months old, it follows that they are completely fledged about the fourth month. This early assumption of the final plumage is the more advantageous to the young bird, inasmuch as the woolly brown coat is like a sponge in the water and may become a source of danger, while the plumage of the adult bird is watertight, owing to the oily secretions of the sebaceous glands. Consequently, until the moult the old birds have to feed the young.

The young birds hardly go into the water at all;

occasionally they will paddle a little. Even the adult birds do not swim a great deal in captivity. They spend most of their time on dry land, the short bristly tail serving as a support, for they have no need to hunt for fish in the water, since their food is usually thrown to them. Sometimes, but not often, they will lie down on their bellies and rest or sleep. When swimming they dive into deep water.

I have described the coloring of the king-penguin in some detail, because as late as 1910 I saw, in a large biological work, a colored plate of *Aptenodytes pennanti Forst*, from the hand of a well-known painter of animals, which was entirely incorrect.

PART V

BIRDS OF PREY

IN captivity the birds of prey are distinctly less entertaining than the waterfowl, while no true nature-lover would wish to see these superb creatures—from the golden eagle down to the buzzard and sparrow-hawk—disappear from their natural environment. Such persons as the "famous" eagle-hunter Dohrn deserve something very different from the publication of their photographs in the popular press after the slaying of their three hundredth eagle. Such inexpressible waste of natural life should be prohibited, and the offenders forced to repent in sackcloth and ashes.

Among the birds of prey are found the sovereign lords of the air. With few exceptions they are denizens of the upper air, and in captivity must reconcile themselves to a totally different mode of existence. None of the so-called flight-aviaries will permit them to fly for hours at a time until well tired out. The most they can do is to flutter about in alarm, seeking to escape, and hurting themselves in the attempt. There can be no free flight for these captives. For this reason the birds of prey always produce a melancholy impression; and since they have not to seek their food, and seldom know the responsibilities of family life, it is not surprising that they sink into a condition of indolent apathy.

Forever sitting quietly on their perches, these birds rarely display any attachment to human beings, even

to their keepers. Birds which have been reared by private persons are, on the other hand, often tame. We had in Rome several common buzzards, presented by private owners, which allowed one to stroke them on entering their cage. We had also a snake-eating eagle from Cyrenaica which had been reared in captivity. If one stroked this bird—it was perfectly tame—it gazed at one with its great, yellow eyes, which were forward-looking like those of the owl, at the same time bowing its body. During the daytime it preferred to creep out of sight, and only really woke up in the evening. Whether this eagle is nocturnal in the wild state I do not know. As a consumer of all sorts of snakes, blindworms, frogs, mice, and rats, to say nothing of crabs—nearly all of which are nocturnal animals—it is apparently condemned to a nocturnal life. This particular specimen had no liking for the sunlight, but hid its head in a dark corner of the cage and dozed throughout the day. Its eyes seem to be adapted to the night rather than the day; and while in the matter of classification it stands between the buzzards and the falcons, it is more reminiscent, with its owl-like face, of the fish-eagles, and is indeed even more like the owls than they. It has shorter legs, however, and does not move so nimbly on the ground. In the evening, when it grows lively, it always perches high.

The great golden eagle (*Aquila reale*), the heraldic symbol of the kingdom of Italy, is still happily common in that country. We have had in the gardens no less than ten specimens, mostly presented. A very striking characteristic of the golden eagle, as of the sea-

eagle and the Australian white-breasted eagle, of which we used to possess a pair, is its absolute lack of sociability. Never once were the two Australian eagles seen together. Even in rainy weather they did not foregather, but each sought cover for itself. Nor was it ever possible to detect any trace of the nesting or mating instincts in these eagles. They seem to be absolutely lacking in any sort of racial feeling, which may, I think, be explained by the fact that in the wild state they are strictly monogamous, each pair keeping within a certain area, and receiving any third member of their species as a disturber of the peace; moreover, in captivity the nesting and mating instincts are in abeyance. Eagles are even given to cannibalism. If several are sent on a journey in the same traveling-cage without sufficient food the weakest will be eaten. On their arrival the cage will contain a few well-nourished eagles, but of the rest nothing save a few pitiful remnants of bones and plumage. Even in captivity instances of cannibalism have sometimes occurred when an eagle has died.

They are all nervous of human beings, and one must be on one's guard on entering their cage, or one may be struck by an eagle taking flight, as its forebears have done since time immemorial. It is significant that only one of our eagles was vicious—a sea-eagle which could not fly on account of a broken wing, and so could not evade the intruder, which explains its behavior. At feeding-time things were naturally lively. The keeper is welcomed with loud and triumphant screams. On such occasions it may often be observed that the sea-eagle in

particular will hobble away with his booty and presently stand still, and again, with uplifted head, utter his scream of triumph. Naturally some more resourceful bird, usually one of the vultures, which can dispense with cries of triumph, and is thinking only of eating, takes the opportunity of stealing the meat. But then "some folks will never learn," and some eagles likewise. Moreover, the stronger continually chase the weaker, so that there is, if possible, almost as much confusion in the eagle's cage as though monkeys were being fed—and that is saying something!

The vultures are very different birds. They sit together in large groups, being, as is shown by their life in the wild state, far more sociable than the eagles. As a rule they are not dangerous to man, and avoid any one who enters their cage. There are exceptions, but they are rare, and a good birch-broom is enough to call them to order. At feeding-time the vultures too are frequently quarrelsome; with outstretched wings and dancing steps they fly at their opponent, who retires a few yards, often to resume the attack when the enemy's back is turned. They will often tug at a piece of meat until one or the other secures it, or until it is torn in two and so honorably divided.

It may often be noted that an eagle or a vulture will decline to break up a dead animal that has just been thrown to it. Apparently it is quite uninterested; but next morning only scraps of bone and tufts of hair will be visible. These birds have a habit, in summer, of eating about dawn.

In general the vultures seem to accustom themselves

to captivity more easily and completely than the eagles; though even eagles may reach a very great age in confinement. About the year 1905 there were two sea-eagles in the Hanover Zoo which had been there since the foundation of the gardens in 1865; and in the *Tiergarten* at Schönbrunn there was once a vulture which had lived there for more than 200 years!

The vultures are sometimes known to nest in captivity, and even to lay eggs; but until lately I never heard of any case in which they succeeded in hatching or rearing a brood. In our collection a pair of bald vultures built year after year, and in Rome a pair of cinnamon vultures nested in two successive years; but on both occasions there was only one egg—the usual number for this bird—and that was addled.

Not until 1923 had we for the first time the pleasure of rearing a young cinnamon vulture. The mother bird built a nest of twigs and feathers in a retired corner of the big flight-cage, brooded diligently, and lovingly reared her chick. If any one approached she tried to cover it from sight and gazed angrily at the intruder. It would hardly have been advisable to enter the cage and go anywhere near the nest. The keeper, however, used to go up to her in order to give her food, since she never moved far off the nest. The male bird remained near her and kept the other inmates of the cage away from the nest. The young bird grew at a surprising rate and was soon hardly distinguishable from the adult birds. However, it can still be distinguished by its peculiar boldness at feeding-time, and, just as among the monkeys, all the other birds regard the

youngster who was born in the cage as their general *protégé*. A sea-eagle, newly arrived when the young vulture was already "on his own," was not inclined to put up with his impudence and therefore attacked him, but next moment he had disappeared under a mass of aggressive cage-mates, who without exception took the part of "their" youngster, and he was rescued only by the intervention of a keeper with a birch-broom. Since then he too respects the youngest member of the community. At the time of writing (1924) the same female vulture is nesting on the same spot, and sitting with the same patience, and I hope with the same success.

The bearded vultures or lammergeiers have long become rarer and rarer in the Alps, and must now be obtained from further afield—from the Balkans or Asia. They live more as do the eagles. To science the lammergeier is properly known as *Gypaetus*.

Two magnificent vultures are the condor and the American king-vulture. One sometimes meets with a vicious condor, but they are more often good-tempered and will allow one to stroke them. The king-vultures especially are usually good-tempered; they come to the gardens when still in their first ash-gray plumage, afterward assuming a really handsome costume—white, with black pinions and covert-feathers, the head and neck being naked and curiously colored. There used to be a king-vulture in the Berlin gardens who not only liked to have his head and back stroked, but would nibble very gently at the caressing fingers. The vultures in general always seem more capable of attachment to man than the lonely and monogamous eagles.

The most powerful of all the birds of prey is the harpy, which, with the crested eagle, really belongs to the eagle-hawks. Six years ago I had considerable opportunities of observing this bird. It was in Hagenbeck's *Tierpark*. Old Herr Hagenbeck was unwilling to part with the rare creature, but it was eventually sold to the Berlin Zoo, where it is probably still living. Harpies rarely come into the dealers' hands, and are therefore greatly coveted; they are always "show" specimens in any zoological collection. The legs and feet are enormously large and powerful and the talons terrible, and the harpy itself is the largest of the birds of prey. When the Stellingen harpy erected his great crest he looked more enormous than ever in his modest provisional box-cage. If one held out a stick to him he promptly seized it with so firm a grasp that it was difficult to pull it away; one felt thankful that he had not got hold of one's arm or leg! But he never attacked with his beak; he always raised himself a little and gripped with his talons, not with extreme rapidity, but with unfailing certainty. During the day he was sleepy, but in the evening, as soon as it was really dark, he became very lively. I often visited him then in order to watch his curious way of dancing on his long perch. He would then perhaps spring at the trellis, in order to scare off any one who came too near, and would even strike through it, so that one had to be on one's guard. Often only at this hour, when no more visitors would disturb him, did he eat the food already given him—meat, or perhaps dead rabbits or guinea-pigs. The bird's habits, and his large eyes, pointed to a nocturnal

or at least a crepuscular mode of life. In the literature at my disposal there were hardly any data concerning the life of this fine and powerful bird, apart from the nature of his food. Only Matschie speaks in his "Bildern aus dem Tierleben" of the evening concert of the howler-monkeys being often interrupted by screams of terror owing to the onslaught of a harpy. Onslaughts on monkeys and parrots would be made in the evening twilight, just as in earlier days attacks may have been made on poultry, dogs, and even children.

The various species of falcon kept in smaller cages are often almost mad with fury when first put into the cage, and sometimes also aggressive. While the snake-eating eagle, some buzzards, and a sparrow-hawk were hand-tame, a pair of Icelandic falcons were constantly attacking, so that one had to ward them off with a broom, and the keeper of course took the precaution of wearing leather gaiters. The attacks of these falcons was always like a bolt from the blue, while a Stampalian eagle in the same cage always danced to and fro on his perch for some time, and gave notice of the coming attack by his general restlessness and by opening his wings, and so forth. From the general behavior of the falcons it is plain that the falconer merely exploits a natural instinct, and that their pursuit of their quarry is no evidence of any special intelligence. In the same way the trained hunting-cheetah is only exercising a natural instinct. If one attempts to teach either bird or beast something that is not natural to it, which it would really have to learn, one is simply met by a refusal!

A pretty if rather dirty eagle is the tumbler or African eagle, of which we have two kinds in Rome, the common and the pale-backed species. The African eagles are the true acrobats among the eagles, as the tumbler is among our pigeons. They turn completely over in their flight. In captivity, of course, the birds have not room to exhibit their capabilities in this respect. They sit idle all day, but always attract attention by their handsome plumage, bright red beaks, bare red faces, and red talons. Our specimens were not timid; some would allow themselves to be stroked. They never tried to grip with their talons, though these are by no means to be despised, but were quite unafraid and did not attempt to escape.

It may be that these birds are often taken from the nest by the natives and reared by them, and are for that reason tame, or at all events not timid. In 1911 there were in the Paris *Jardin des Plantes* nearly a dozen young African eagles; they were still of a uniform chocolate brown. That birds which are caught young or, better, taken out of the nest and reared by hand may become perfectly tame is a matter of frequent observation, and the fact is often commented on in the sporting press. They are of course tamest when they remain in private hands.

The owls are also most readily tamed. Though ignorant folks have decried them as birds of ill omen, they are, as a matter of fact, entertaining and congenial creatures. Is not the little owl, with his great yellow eyes and his continual cracking voice, a comical figure? And how tame the owls become! Unfortunately, they

are flesh-eaters and therefore are too malodorous to be kept very long in a room.

All owls readily become tame and confiding. An eared owl in the Hanover gardens was so tame that when his keeper appeared he used always to sit on the meat-trough and take the gobbets of meat from the trough, and the idea of flying away never seemed to enter his head, although the owls in general very soon detect and profit by any slight defect in the trellis of their cage. To bird-lovers the screech-owls, when they fly up to a lighted window and utter their call, the famous "death-cry," in the light of the lamp, are as fascinating as they are at other times unwelcome: for example, when a bird-lover has been incautious enough to leave a bird-cage hanging in the balcony at night where there are screech-owls about. A friend of mine who kept a number of bullfinches began to lose birds daily, until he one day surprised the screech-owl dexterously dragging the last bullfinch through the bars of its cage. In misdeeds of this kind they compete with the magpies, which, however, as diurnal birds are less successful in their depredations, since they have not the same opportunities for crime. Nevertheless, owls are delightful creatures, and it would be unjust to demand their extirpation because a few bird-fanciers have been careless; and such offenses as I have described do not in any way detract from the great economic value of the owls, especially to agriculturists. Even the eagle-owl or great-horned-owl can be tamed. An acquaintance of mine had a horned-owl which he employed when he went rook-shooting. It was perfectly tame, allowed

itself to be stroked, and at the word of command jumped into a knapsack in which it was carried to the rookery. It was absolutely as obedient as a dog.

Our three Roman horned-owls came to us at different times, first one, then two; but they never quarreled at all. The first arrival only was rather cheeky; the others were not. On the other hand, we had two snowy owls which were very bold, and one was given to attacking one's legs when one entered the cage, which was something over twelve feet square and about twice as high. The trouble was, of course, that they had not enough room to escape as far as they would have liked, for the snowy owls prefer to keep to the ground and very seldom take to the trees or their perches. We had also a perfectly tame Abyssinian eagle-owl, which always crouched on the ground, emitting a sort of clicking sound when one caressed it, and took bits of meat quite politely from one's hand. But it liked to hide away in the daytime, lying with closed eyes as though dead, and hardly to be recognized against the gray stones. The snowy owl is the liveliest of all the owls, even in the daytime. This is doubtless because it comes from a land where the days are endless in summer and the nights in winter. But it is most lively, most aggressive, and perhaps most inquisitive at twilight or after dark. I was once unsuspectingly passing its cage with a fox-terrier on a lead, when both owls drove mewing against the trellis. The consequence was that I was left with only the lead and collar in my hand; the terrier had fled!

In the Hanover gardens at one time a pair of

European and a pair of Virginian horned-owls lived in adjacent open-air cages. In the evening, when visitors were passing the cages or standing before them, the owls would rush against the trellis. Whether this was due to aggressiveness or curiosity it is difficult to say; probably to both. In the daytime they were quite apathetic, and only woke up toward evening.

Nevertheless, all owls are very fond of the sunlight, and nothing could be more mistaken than to keep them in narrow, sunless cages. The beautiful barn-owls are apparently the least able to endure the sunlight. They seem to be essentially creatures of the night, whereas the screech-owl and the wood-owls can see in the early evening, while the eared-owls often fly in the full sunlight. I have, unfortunately, never had an opportunity of observing the horned-owl in the wild state.

On the whole, the owls—which the Greeks regarded as the birds of Athene, the goddess of wisdom—are by no means unintelligent. Their capacious brain-pans are evidence of this. The birds of prey might perhaps be ranked thus in order of intelligence: Owls, lammergeiers, vultures, eagles, and falcons.

We have seen that the owl becomes tame and attached to man. Its quiet yet entertaining ways, the human expression of its face, with its forward-gazing eyes, make the owl a peculiarly interesting bird. The old superstition, which had its origin in its nocturnal habits, ought to be stamped out. The shriek of the screech-owl before a lighted window, which is all that attracts it, for it really has no thought of foretelling an appointed death, or the hooting of the barn-owl

on the gable-end in the night, should no longer fill us with dread. Why have not people conceived other prowlers in the night—such as badgers and martens—as creatures of ill omen?

Owls are pretty and lovable birds, which gaze out at the world with curiously intelligent yet somewhat dreamy eyes, and are honestly deserving of our protection (and in most countries they are now protected by law). For their secret nocturnal activities are all to our advantage. Mice and rats are their principal prey, and these are at the same time our worst enemies. One can only think with horror of the quite inconceivably barbarous practice, which one can only hope has died out, of nailing *living* owls—and particularly barn-owls—to the doors of barns, and leaving them writhing, to die wretchedly—in order to avert ill fortune and drive away evil spirits! The new wild birds protection acts have at last made such vileness or stupidity punishable by imprisonment.

TOUCANS, PARROTS, COCKATOOS

TOUCANS often come into our hands. The beautiful and magnificently-colored banana-bird, however, is rarely seen in zoological gardens. A very remarkable bird is its relative the turacou. The color of its wing-feathers is not "fast." There was some years ago a fine specimen of the East African blue-crested turacou in Hagenbeck's *Tierpark*. Whenever this bird had bathed, the water was dyed red and the red wing-feathers were pale; the same thing happened when it rained. In the living bird the red dye-stuff, known as *turakin*, was presently re-secreted; but if a plucked or fallen feather were soaked in water the red color naturally did not return.

The toucan's monstrous bill is really quite light, and in actual fact by no means so terrible as it looks. You can safely let the bird bite your finger—with the side of his bill, of course, not with the point; it feels as if it were being squeezed between two large paper-knives.

This great bill gives the bird such a dangerous appearance that it may be the reason why the toucan is so seldom favored by bird-lovers. Apart from its looks, the toucan is a delightful companion; its whole nature is so comical. In its inquisitiveness and its habit of constantly searching every corner of its cage it is just like a monkey.

Haacke suspects and Matschie flatly accuses the

toucan of stealing eggs and nestlings. I can extend this accusation in that I have actually seen the green-billed toucan catch and swallow innumerable sparrows. In Hagenbeck's *Tierpark*, at feeding-time, when the whole bird-house rang with the quackings and joyful shrieks of a flock of some five-and-twenty toucans, the sparrows came in through the wire netting of the toucan's cage, in order to share their food, even in the indoor cage. But—poor sparrows!—in the indoor cage, which was more or less unfamiliar to them, they were scared and bewildered, and ended a brief flutter as the prey of the long-billed toucans. Mice too were promptly despatched.

The agility displayed by the toucans in chasing their prey was amazing, and baffled all attempts at rescue. I have seen five or six sparrows caught at one time.

Other toucans have the same habits. They are not harmless fruit-eaters but wolves in sheep's clothing.

The exact purpose served by the monstrous bill cannot as yet be definitely stated. In the case of the rhinoceros-bird we can explain the huge beak by the fact that the male, having immured his mate at breeding-time, has to feed her on the nest. The toucans also nest in hollow trees, but I can find no mention in the books of their immuring their mates. It is not, however, improbable that the huge though feather-light beak fulfils its purpose in the tending of the mother and her brood. The male bird would be able to reach far into the nest-hole. Otherwise the beak seems thoroughly ill-suited to the business of food-getting; un-

like the fantastic but admirably adapted bill of the flamingo. With such a beak the toucan can take only a very little soft food at a time; even a piece of banana or other fruit has to be pushed backward and forward for a long while until the correct position is reached and it can be swallowed. As for the sparrows which were caught, the toucans crushed them to pieces with the edges of their beaks, passing them through sideways; and they dipped them often in the water. Until a toucan had managed to swallow his prey he jumped about with it in his beak, frequently going to the water-trough. It evidently went down better when thoroughly soaked.

The sleeping position of the toucans is most peculiar; they will sit with their tails pointing to the zenith. When the green-billed toucans do this in an open cage, with their brilliant red rumps turned toward the public, their attitude does not seem very respectful. They assume it before dark, so that many a visitor to the gardens is amused or rejoiced by the sight.

The parrots truly and above all things deserve the name of climbing birds. They possess a very special expedient for climbing in the freely-moving upper mandible, which is found in no other bird. In the act of climbing, the parrot uses the upper mandible as a hook with which to support itself and draw its body upward, while it seeks a fresh point of support with its feet when it reaches a still higher position with its beak, and so forth. Its beak is thus its most effective means of support, whereas another great climber, the

woodpecker, supports itself chiefly by means of its spiny tail. As the beak is used for climbing, so the foot is used as a hand for holding food. All parrots turn the foot outward on grasping food.

The oldest of the order, according to Professor Reichenow, is the Nestor cockatoo. This, like the flightless nocturnal owl-parrot, is a native of New Zealand. Recently, I am glad to hear, the New Zealand Government has taken measures to protect this handsome and remarkable bird. In the zoological gardens, despite its simple, dark green, black-edged plumage, it is extraordinarily entertaining, hopping about on the ground like a raven, or suddenly jumping sideways; or, in the case of some more accomplished bird, laying its head on one side and dancing round and round at the word of command. Nestors will readily learn to talk or whistle.

But what are we to make of this cockatoo's habit of eating flesh? For the Nestor—or kea, to give it its native name—does eat flesh; it has somehow adopted as its diet the kidney-fat of the living sheep. According to one acceptation, this came about as follows: As sheep-breeding increased in New Zealand the skins of slaughtered sheep were often hung up to dry, and the keas began to nibble the fat from the hides with their hawk-like beaks. Soon they began to fall upon live sheep and tear out the kidney-fat from their living bodies. In the course of time this fat became their necessary nourishment, so that today one could not keep them in health without giving them fat mutton, or some acceptable substitute—for example, horseflesh.

However, in one zoological garden a kea died simply because it was fed, during the director's absence for several weeks, and against his instructions, on horse-flesh!

In Rome we keep all the parrots in great aviaries. The wire netting must of course be of fine mesh. This plan has given excellent results. The only criminals we have had were two bald-eyed cockatoos, which built a nest together, not once but many times, either in an open box hung high up in the cage, or in a hollow tree planted upright in the floor. However, they never completed their nests but always destroyed them. They were then put by themselves into a smaller cage, provided with nest-boxes and nesting material, but would now have nothing to do with the nest-box. This cage was open at the sides and in front; but it seems that a large aviary, with only the front and part of the roof open, is the only sort of cage adapted for the breeding of these birds; they do not then see and are not disturbed by the inmates of adjacent cages.

At last, in 1923, their attempts to breed were successful. The parent birds, who had been living in the gardens since 1910, contrived with their beaks to extract a stone from the wall, which was twenty inches in thickness, and in the hollow so formed they nested. We left them quite undisturbed, and one day we saw three almost fully-fledged cockatoos emerging from the hole in the wall. Both parents dutifully fed the young, and continued to do so long after they had left the nest. The father was the first to repulse his importunate

offspring, while the harassed mother continued to provide for them for some time longer.

Five rosy cockatoos who shared the cage with the bald-eyed cockatoos willingly subordinated themselves to the bare-eyed family, who were quite consciously and deliberately overbearing. The entrance of a human being into the cage evoked a terrific din, which ceased only on the intruder's retirement. If he went near the young birds the parents flew screaming toward him, or even flew at his head. In the year 1924 the parents again reared a brood. It is delightful to watch the young birds playing together like puppies on the floor, with their legs in the air, and rolling over one another. Never before have I seen parrots or cockatoos play together in this fashion, though I have seen them play thus with human beings.

This case is worth recording, as only very few instances are known of the breeding in captivity of cockatoos or other large parrots. Smaller species, such as the budgerigars, do of course breed abundantly.

As the smaller cage proved unsuitable, the two parents were sent back to the macaws and the sulphur-crested cockatoos. They did not, of course, molest the big macaws; but the little creatures united in persecuting the much bigger sulphur-crested cockatoos. Finally one of them tore out one eye of a sulphur-crest and otherwise terribly maltreated it. Only the intervention of a keeper saved the poor creature's life; not one of his three comrades had taken his part. Peace was restored only when one of the firebrands was banished to

a distant cage, where he had to live in the company of small cockatoos and parrakeets. Neither of them attempted any further wickedness, although they could still see one another through the netting of their cages.

Cockatoos are excellent fliers. I remember one that escaped from a zoological garden; it was pretty to see it flying high above the trees, and then sitting in the lofty oaks. One realized once more on this occasion how very inconspicuous even a strikingly-colored bird is amidst green foliage. The truant returned toward evening, entering its cage through the hole it had bitten in the rusty wire-netting. The bird was not at all tame, but its gnawing stomach drove it back.

Cockatoos in general are not great talkers; and this included even the familiar rose-and-gray cockatoo. It often becomes very tame and confiding, but one sometimes comes across a bird which never tires of making a noise like the squeaking of a rusty hinge, calculated to drive its owner crazy. In other respects it is a friendly and lovable creature, and with the ashen-gray of the back, the rose-pink of the breast and under parts, and the rather brighter rose of the head, it is at once one of the handsomest and at the same time one of the most simply-colored of the parrots.

The group of gray parrots contains the best talkers of all the parrots—the familiar jako, the gray parrot with the bright red tail, and the darker Tinmeh parrot, with a copper-colored tail. I have owned several gray parrots. Some died directly after their arrival; two others lived longer, but I had bad luck with both of them. One of these I bought from among a dozen. The

six cages, each containing two birds, were set in a row, each cage containing a perch, on which the birds passed most of their time. One day, on visiting the birds, I noticed a curious thing: the moment my parrot (as she was to be) climbed up one side of her cage, all the eleven other parrots climbed down on the opposite side! The solution of the riddle was that she had one day bitten one of them on the foot!

To me she was a dear and faithful companion. After some nine months I gave her to my little sister, then seven years old, and with her she lived two years, dying miserably of prolapsus of the rectum, the veterinary surgeon, unfortunately but naturally enough —probably because he lacked experience—refusing to treat her. A parrot is an unusual patient, and hens and geese are birds of another feather. She was friendly to all alike; she did not talk much, but whistled beautifully. It afforded her great amusement to come out of her cage and push up the clip of her water-tin from outside, upsetting the tin into the cage; or, while standing on the cage, to lift a picture off the wall so that it fell against the cage. Once she extracted quite a number of photographs from their frames and proceeded to cut them to pieces. My little sister used often to dress her up in doll's clothes, usually with hat and mantle, or lay her in the doll's perambulator, when she was supposed to be sick. She was always conscientiously acquiescent. Only when food appeared was Lotte—as we called her—unmannerly. She then emitted the unpleasant grating tones which are unfortunately characteristic of her species, in order to

obtain some titbit. The idea that birds should wait while human beings fed had never occurred to Lotte. But it happened repeatedly that she refused food, and without apparent reason, until we noticed that she did so whenever the canary had been given anything first. Jealousy! Lotte, and other parrots too, had a great aversion to this canary; and while she did not bother herself about other small birds, she was continually climbing on to the canary's cage and trying to bite it. It would seem that its bright yellow color was displeasing to the parrots.

When on fine days Lotte was taken to the balcony she used to climb about the outside of her cage. There was no danger of her flying away. If a sparrow or perhaps even a mouse from the stable entered her cage, Lotte barked just like a dog; but only on such occasions, which shows that she was aware that barking was a means of frightening other creatures, even mice and sparrows. But she never attempted to chase the latter.

That Lotte always regarded me as her original owner was shown by the fact that whenever I was at home she always wanted to sit on the back of my chair at meal-times. Once, as we were sitting at supper, we heard peculiar steps in the next room. It was Lotte. She came down from her cage, where we had left her, stepping daintily through two dark rooms, into the dining-room, and without more ado clambered up on my chair.

At night Lotte slept with a cloth over her cage, and when this was put over it she always said "Hush!" very softly, by way of "good-night." One morning, about Christmas-time, there was a terrible to-do; my

RED MACAW
Jacob

RAVENS
Giorgio with a younger raven

little sister was crying; Lotte was gone! The cage stood empty and uncovered. What had happened? For some time all our searching was fruitless; but at last the truant was discovered on a window-sill, where she had somewhat disheveled a box of crocuses that were coming into bloom. However, that did not matter as long as Lotte was found.

She was only too fond of being kissed and caressed. She herself would rub her beak along one's cheek, and had a fancy for pulling hairs out of my none too luxuriant mustache.

She always greeted one by clambering up one's arm to one's shoulder and giving and receiving caresses. She was particularly fond of sitting on the back of my chair, when she would lay her little head against my cheek as I bent backward. Best of all, especially in the twilight, she liked one to sit thus and talk nonsense to her, very quietly and gently. It is curious to note what a great influence a quiet, gentle human voice has on all animals.

In Lotte, as in all parrots, emotion was announced by the rapid dilation and contraction of the pupil. I have found that in strange birds this continual dilation and contraction of the pupil is a sign that circumspect handling is required. The smaller the pupil, the more contented and cheerful is the bird. When my macaw was greatly delighted the pupil contracted to a tiny black star. This movement of the pupils is, if one comes to observe it, very striking in all birds, and can of course best be noted in parrots with light irises, such as the gray parrots and macaws; less easily in

the Amazon parrots, with brown irises; and hardly at all in those with black irises, such as the cockatoos and parrakeets. In the case of my fire-winged parrakeets, Max and Moritz, with their black beady eyes, one could not see it at all.

This movement of the pupil is often accompanied by a ruffling of the head and neck feathers and a slight raising of the wings.

This ruffling of the plumage is also, under some circumstances, a sign of anger, or the desire to frighten another bird by an apparent increase of size. Lotte ruffled her plumage when she barked at mice. Parrots ruffle their plumage also when they believe themselves to be threatened; for every parrot resents mishandling and pecks at the stick or hand if any one attempts to beat it.

The color of the gray parrot's face does not change when the bird is excited, whereas in the macaw the face is flushed by the rush of blood to the head; the face may become rosy red, and the head burning hot. Despite her attachment to us, Lotte did not possess enough initiative ever to fly to us. The gray parrots are distinctly poor at flying. If Lotte ever did fly it was to get something to eat, and then she never landed where she intended. Thank goodness, she never indulged in the purposeless, panic-stricken flight to which some birds are prone. If she wanted to come to one she told one so by bowing and skilfully opening her wings. Sometimes she became what we called *fimmelig*—excited and unreasonable. This condition, which one can only explain as a desire to fly away, oc-

curs in many parrots in the twilight. If they are outside they want to come in, and a terrible shrieking begins. They disdain the choicest titbits. Scoldings and caresses are equally ineffectual. The bird is oblivious of such things. The best thing to do is to put it in a room by itself and leave it undisturbed. When the twilight is over, the bird grows quiet again. During the short Roman twilight I have observed this condition not only in parrots but in all my birds; and it was the same even if they had been indoors all day. Then the best thing to do was to darken the room.

I think this unrest is merely the expression of a natural instinct, which at this hour impels the bird, when in the wild state, to seek its sleeping-place. This instinct may be observed both in sociable and solitary birds—for example, in parrots and in bullfinches.

Before they go to sleep, and especially when they are disturbed by artificial light, parrots all begin to grind their beaks, by pushing the lower mandible along the upper one, producing a sound that is enough to drive one crazy. From the macaw to the budgerigar, they all do this. The only remedy is to darken the room. I have seldom heard this sound in the daytime, and then from gray parrots and macaws. It seems then to be due to tedium, and the bird stops it immediately if given something to occupy himself with—a piece of wood or cardboard or a newspaper to bite—or if one pays attention to him.

To return to Lotte: she lived, as I have described, with my parents and my little sister, a dearly-loved house-mate. Then one day she was very ill, and that

she might not die before my sister's eyes I took her with me to Kiel. A few days later I buried her under the beautiful beech-trees of the Düsternbrooker wood. Poor, good little Lotte! She was a bird whom we all keep in faithful remembrance, such as those creatures deserve who give their all to their masters—who love them, and deserve to be loved in return.

Lotte's successor was another type of gray parrot, small, a very light gray, and rather long in the leg, and the upper mandible was longer and more pointed.

The external sexual differences of most parrots are so slight and unreliable that I will not venture to say whether this bird was a male or a female. The beak perhaps indicated the male sex.

This bird had been kept in a small cage; he talked well and freely, in good Schleswig-Holstein dialect, but had never been let out of his cage. Naturally, he bit even the woman who sold him to me, who had had him for months. I put him at once into a much larger cage and got him accustomed to me. He never bit, and he was fairly quiet. Now and again he squawked a little, and if I scolded or threatened him he promptly retorted: "Look out!" Or he would utter a "You!" very long drawn, with a warning intonation. If I threatened him with a stick he replied: "Look out! Where's the stick?" This last word with a fine Schleswig-Holstein drawl, and a Hanoverian *st*.

Not once, never once, did the bird utter these words unmeaningly, but only when some one was scolded in his presence; then he too assumed a threatening tone, just as monkeys immediately begin to scold any one

who is being scolded by their owner. Monkeys, like parrots, are anxious to defend their master.

In the afternoon, at "coffee-drinking," we would often hear "Want cocoa!" or "Cocoa, want sugar!" which my sister would give him. We had always to satisfy him at once, or carry him out, for otherwise his squawking became unbearable. It was the same when he heard hoarse or loud voices, and particularly the voices of strangers. On such occasions he had to be taken out of the room.

When I first let him out of the cage, after about a fortnight, he was quite good but a little timid, since this freedom was something quite new to him. He then stood right up on his already long legs, and at first would only allow his head to be scratched; apart from this he would not allow himself to be touched, for hitherto, of course, he had never been handled.

Now and again, quite unexpectedly, he would bite the hand that held him, as though he wanted to discover what it was. A tap with a pen-holder, and on one occasion a good box on the ear, taught him to play no more tricks of that sort. When he came into my sister's hands—she was then eleven years old—she was at once able to do anything with him; she could put him to bed, just as she did Lotte, and make him "do treadmill" on her two forefingers. He submitted himself unconditionally to my sister; to me only after a few little arguments; but then he had been wrongly brought up. For my mother, however, he had a deadly hatred. Perhaps she reminded him of his former mistress. Finally, while I was holding him on my hand, he gave her such

a vicious bite that even my sister decided to part with him; so I took him to Stellingen, meaning to keep him there while I was working in Hagenbeck's *Tierpark*. I arrived there late in the evening, and the bird ate scrambled eggs with me, to the astonishment of the restaurant-keeper, holding his food delicately in his foot. In order not to harass him by shutting him up in a small traveling-cage, I took him out early next morning and set him on the back of a plush-covered armchair. This was perhaps a mistake; it bewildered the bird, for the plush, of course, gave under his feet; the feeling was unfamiliar, and he became restless, while I withdrew to an open window, which was, however, covered by the curtains. I mention this expressly, for when I opened the door in order to take in my boots a rush of wind passed through the house, the door flew open against the parrot's tail, and he himself, losing his head, flew out between the curtains and disappeared in the gardens opposite. Hagenbeck's men, who had experience in such matters, searched for him in vain; yet, as I afterward discovered, he had spent the whole of the first day not far from the house, on an arbor in the middle of the garden, which we had searched three times over! We could hear him whistling, but could not detect him amid the foliage. And a parrot will not come down from his height; one must climb up to him, or reach him a stick to clamber down, or knock him down with it. It is a remarkable fact that parrots cannot be induced to climb down from a height. I saw the bird on two different days, flying high amid a flock of blustering sparrows, and then saw him no more. I

advertised in the newspapers; all in vain! Since on the following nights there were heavy rainstorms, and the neighboring woodlands are full of wood-owls, I am afraid the poor bird must have come to a sad end.

In character this bird was very different from Lotte. Unlike her, he attached himself to only a few persons —first to my sister, then to myself. Physically he was much quieter and less active. If one opened the cage-door he proudly took up his position on the cage-top, but did not undertake any voyage of exploration. On the other hand, he was very liable to fly off at random in the senseless fright peculiar to parrots, and often flayed the cere of his beak and cheeks. He could of course only be let out of his cage in a closed room.

If I may judge from my two gray parrots, the less active birds are the better talkers.

One often hears people say: "He (or she) gabbles like a parrot!" The comparison is not wholly just. When a parrot sits proudly on his perch and calls out "Lora! Pappagallo!" or what not, as my blue macaw used to do, its utterances are almost always meaningless and indicative only of a contented mind. But when the gray parrot Lotte tried to scare sparrows and mice away by barking like a dog, she connected the sound with her intention of scaring the impudent intruders; and she barked only on appropriate occasions. And, in the same way, my second gray parrot always employed the words I have described him as speaking in accordance with their meaning. It is perhaps needless to say that the bird understands only the sense of the remark as a whole, and its consequences, which for it are more

important! Never, for example, did the second parrot, instead of calling out "Cocoa, want sugar!" cry "Where is the stick?" by mistake. We may therefore conclude that as parrots sometimes gabble, so they sometimes speak with deliberation. When a foreigner has acquired or, as we say, "picked up" some necessary expression in an unfamiliar tongue, he knows only the word and its consequences for himself; but of the etymology and grammar of the expression he understands as little as the parrot.

Once again I tried to acquire a gray parrot. Again I was unfortunate. He was a big, superb specimen but unapproachable. I might speak to him never so kindly, but all his reply was to regard me with a most vicious expression and bite angrily at the bars of his cage. I had him for about three weeks, and he seemed to be suffering from homesickness; so I wrote to his former owner, asking him to take the bird back, for he was only being made miserable to no purpose. It was touching to see how the splendid bird simply shot out of his cage and, with all possible speed and open wings, clambered up his old master. He was quite beside himself with joy at seeing him again, and bird and master lavished caresses on one another. Parrots are not like monkeys, who will refuse to recognize their former owners. This bird afterward came into the hands of a single lady and became quite accustomed to her. Here again we may see how deeply rooted are the animals' inclinations and aversions to human beings.

I ONCE had a curious experience with a floral parrakeet, Memino. The bird was given to me by a lady who had often expressed her delight in the assembly of the parrots on my balcony. Although he had his good days, Memino was so aggressive, and bit with such vicious fury, whether in his cage or loose in the room, that after six months I gave him away. But he became, if anything, even more vicious; he would actually fly at people in a room and bite their hands. He was returned to me and placed in one of the aviaries in the gardens, where he had to behave more discreetly. I am sorry I did not dissect his brain after his death; the bird was undoubtedly mentally abnormal.

Memino's place was filled by two fire-wing parrakeets. They were named Max and Moritz, after the chimpanzees, and they really did credit to their names! Fire-wing parrakeets are readily tamed, and Max and Moritz were no exceptions; as soon as they were released from their traveling-cage they stepped upon my hand.

But with all their tameness they did not like to be held in the hand; they would duck backward as they sat on one's finger, and bite—and despite the smallness of their delicate, flesh-pink beaks, they can give one a good nip. However, when they were being carried on my finger from their sleeping-cage to the big

day-cage on the balcony they would allow themselves to be stroked, and did not attempt to bite. In the morning they could never go out too early, but they always wanted to come indoors before dusk, and, morning or evening, they expressed their desire to be carried indoors or out in an unmistakable fashion, clambering up and down the side of their cage and squawking. Max, the cock bird, recognizable by his longer upper mandible, was always the first to come to my hand: and then Moritz, the hen, lost no time in following suit. If one separated them for a joke their shrieks were incessant.

They were fond of fruit, raw and cooked, macaroni, rice, and all sorts of sweet dishes; of seeds they preferred those of the sunflower. But they never touched anything, despite their shrieks of triumph, so long as any one was near them. Only when they were alone did they set-to in comfort. They would, it is true, take a cherry or the like from one's hand, but only to throw it down on the sand; and then, to rescue the titbit, they swung upside-down on their perch and climbed down the bars head downward. Anything they wanted from the bottom of the cage they always fetched in this way, never going upon the floor. They loved bathing, in a large round bath which was hung upon their cage, and came out wet as drowned rats. But here again one had to use stratagem to observe them. Moritz in particular used to waltz about in the water. On hot days they bathed repeatedly.

They often flew loose about the room, and were fond of clinging to the tops of the curtains; one had to

shake these in order to bring them down. If I had one bird on my hand the other at once alighted on it, chortling. The fire-winged parrakeets are truly inseparable; one cannot exist without the other. Yet they often peck at each other, with terrible war-cries, for minutes at a time, though without doing any harm. They did this especially if I had been teasing them a little. The moving of their cage was enough: they could not endure to have it moved. As soon as I turned away, domestic peace was restored.

Over and over again Max and Moritz contrived to open the door of their indoor cage. This was something of a feat, for the cage was intended for a gray parrot and had a good latch. They did it always in the early morning, and then clambered up the wall by the leads of the electric lighting, in order to tear the edge of the wall-paper to shreds; so their cage had to be more securely fastened. Repeatedly, too, one or the other flew away, usually because it was frightened—for example, by the sight of a broom, of which these birds had a crazy terror—while my housekeeper was carrying them out in the morning to their big cage in the balcony; and if one flew off, the other wanted to follow. On these occasions the truant usually spent the whole day in the same thick-leaved ilex-tree; the stay-at-home, playing the decoy, running to and fro, until at dusk, at the very latest, the wanderer appeared on the cage, to be greeted with triumph by the lonely occupant. If despite its undoubted hunger the truant still refused to come on my hand, my housekeeper, to whom the birds were more obedient, took the bird in

the cage on her hand, in order to carry it away, and the other immediately followed. In this way they repeatedly escaped into the Borghese gardens, but I was never anxious about them; today it might be Max, tomorrow Moritz, but I knew they would come back. They would not allow any stranger to catch them, and they could scarcely be detected amid the foliage. The fire-winged parrakeets are extraordinarily strong on the wing, and it is pretty to see the fiery red underwings as they fly.

One evening Max and Moritz were not carried in until rather late. My housekeeper stumbled as she entered the room, and Max and Moritz were off and away. Next moment, however, they had flown into the brightly-lighted bird-room through an open window, and were sitting, triumphantly shrieking, on their cage.

As time went on, Max and Moritz became more and more like their namesakes, and to me even cheekier than ever. Indoors or out, there was always quarreling when I appeared. They were then best quieted by the exhibition of a wide carpet-brush, which had to be repeated from time to time. And this although I myself always fed the worthy pair—and when I was feeding them I had to take care lest they bit my fingers! Strangers they drove away by shrieking at them. If I invited any of my acquaintances to tea on the balcony, they had to sit in the doorway so that Max and Moritz should not see them.

Later on a large aviary from the bird-room was installed on the balcony, and the birds were then put into it through the window. They took the greatest delight

in posting themselves at the corner of the cage nearest the balustrade on which the macaw used to walk to and fro, and scold at her, when she would stop quite close to the cage and quietly gaze at the brawlers. In the evening my housekeeper used to bring them in; they came to me only if left out very late. Then they would sit at the top of the cage, on one of the perches, among the indigenous birds, climbing down a stick or the trellis of the cage to reach one's hand. If I ever went into the cage they bit my clothes or even my fingers in their rage, and I had to look out for myself. In the daytime, too, they were no longer obedient, but flew away instead of coming to hand. For all these reasons they were restored to their old cage, where they long continued to enjoy life.

The macaws are the largest of the long-tailed parrots, and indeed of all the parrots; but the long tail makes them look even larger and the powerful beak much more formidable than they really are. I have had several macaws and always found that they are the most faithful of all birds, and those most capable of attachment to individual persons. They display a constancy unsurpassed even in the dog, and adapt themselves marvelously to their owner's idiosyncrasies. They are not in the least vicious, as ignorant persons suppose. Nor are they by any means lazy or sedentary birds, though often compelled to be so by their chain or cage. In a large aviary macaws produce a very different impression. The first time I saw red macaws in a large aviary was in the zoological gardens of Copenhagen, in 1903. These, as the late director told me,

had been turned out into the open in winter—for only one-third of the aviary was roofed over—as incurable feather-eaters; and they were now simply faultless. In Rome, almost from the first, they were kept in large aviaries and got on wonderfully well with the other parrots, and also with guinea-fowl and other birds; the only brawlers were, as I have recorded, the bald-eyed cockatoos.

There was of course no lack of love-making. A great red macaw, whose plumage was a much darker and fuller red than is usual, contracted a permanent and faithful union with a green-winged macaw, apparently a male bird, and there was no unpleasantness between them. Another green-winged macaw, which I first had in my house when still weak from the journey to Rome, mated with a red mæcaw, which I had also kept in my house until it recovered from the journey. Both were very tame; but after they were put together in an aviary in the bird-house they were so jealous—especially the plump, tailless male—that one had to take a stick into the cage, for the fat little fellow attacked everybody's boots. His mate, Jacob, looked on, apparently well pleased to see her husband defending her.

The macaws, as I have already said, are the most delightful of companions. I have had a blue macaw for fourteen years, who really chose me to be his master. It was in the summer of 1910, in Hagenbeck's *Tierpark*, and there were there at least twenty macaws, on stands, from the small blue-gray-headed spix-macaw to the great hyacinth-macaw. The spix was a charm-

ing little fellow, who bit on occasion, though he did no serious damage; but the great hyacinth-macaws, whose monstrous beaks look so terrible, were all hand-tame, as they commonly are. I amused myself by trying to tame the red-, blue-, and green-winged macaws, and I tamed them all so far that I was able to take hold of them. The least tractable, on the whole, were the green-winged macaws, whereas the great green macaw in our Roman Zoo, of which I have already spoken, while still in the possession of his former owner, a sculptor, used to spend the day in the fruit-trees of the garden and slept at night in the fowl-house.

The more you allow parrots to bite at the back of the clenched fist, the sooner they become good-tempered, for then they can only scratch with the upper mandible; they cannot bite, for the mandibles do not open far enough. But woe to you if you hold out a single finger, or the open hand! They will allow you first to touch the breast, then the head, and finally the back with your clenched fist, and gradually you may begin to open your fingers.

Even in an aviary tame macaws will remain tame. In any case, they are far more interesting to observe in an aviary. I do not know who first had the bad taste to keep parrots chained to stands; probably the practice began in the traveling menageries. Apart from all other considerations, parrots, and macaws in particular, are incomparably more decorative in an aviary, because one sees the birds in free movement. In Rome we kept all our parrots on stands at the outset, but

lovers of animals showered complaints upon us, so that we were all the more willing to make an end of the old system.

Among the parrots in Hagenbeck's *Tierpark* was a blue macaw which from the first paid me a great deal of attention, whose full significance I did not at once grasp. When I went up to her, her face became quite red, and she drew herself up, unfurled her wings, and lifted the wing-points, so that she looked like a heraldic eagle. Her pupils dilated and contracted, becoming finally like little stars, and she ruffled up her plumage. Now she would sink her head upon her breast, now lift it high and bend it backward. This movement expresses a feeling of triumph, and is also the most ceremonious form of greeting. A more familiar and less ceremonious form of greeting is the following: The bird opens one wing and stretches a clenched foot out under it.

If I passed quickly by without noticing this macaw, she bowed herself forward and opened her wings a little, as though she wanted to fly after me. When I went up to her she would eagerly come to my arm, or, still on the chain, would let herself fall into my arms and lie there with her feet in the air, to be caressed. I was standing with her thus in my arms one day, in the Stellingen bird-house; it was raining cats and dogs, and there was not a soul to be seen. Then a voice sounded behind me: "Well, she has soon made friends with you!" It was old Herr Hagenbeck, who, as he so often did, was making a round of the park in the pouring rain. "Then take her to Rome with you," he said,

THE AUTHOR WITH BEAUTY AND JACOB

LOTTE

when I had told him of the bird's curious attachment to me. So Lora, as she was called at first, has since then lived with me—a living memento of the dear "*alter Herr*," as Herr Hagenbeck was known in his *Tierpark*.

At first I kept the bird chained to a parrot-stand and let her loose only when I was at home, but after a fortnight the chain disappeared indoors and was used only when the bird was on the balcony. Her great ambition was always to climb up on my shoulders. Then she would take my nose gently between her mandibles and press it from base to tip with the tip of her thick black tongue. It was a curious feeling at first, that of one's nose in *that* beak! Then the pressing with the tongue was extended all over my head, while my hair was gently drawn through her beak, but never pulled out. It is curiously difficult on such occasions to get the bird to come off my shoulder; and I have found this with all my parrots. They push one's finger away, or even bite. I think this is because the bird draws back from the hand, hanging on behind the shoulder, and so is no longer in a position to set a foot on the hand.

Lora is particularly careful of my eyes, which are only touched tenderly with the tip of her tongue. My hand, on the contrary, sometimes receives an affectionate but more painful bite, generally to the accompaniment of triumphant nods, followed by more tongue-taps. Lora loves to come to me in bed, and takes a special delight in tapping my naked arm or throat with her tongue, or catching hold of my toes if she happens to get a sight of them; and this she does with

the greatest triumph, and particular tenderness—she knows perfectly well that they belong to me. If I am ill, Beauty, as she is now called, will stay on my bed only too willingly, forgetting her food and water, and never making a mess. Beauty is absolutely clean in a room. If she wants to leave the room she makes her want known by gesture, and is quickly carried out. I have never before heard of perfectly clean parrots, and yet it was very simple to teach the bird to be clean; it was only necessary to watch her, take her quickly to the stand when necessary, praise her a little, and carry her back.

Woe to any visitor who comes too near me, or the doctor, who insists on taking hold of me! Beauty, emerging from under the bed, makes an onslaught on his boots, and he has to take refuge behind a basket-chair. Then my housekeeper has to carry the angry bird to her stand, and unless she is on her guard she may receive a bite on the way; while I try to scare the bird away with a fly-flapper which lies ready to hand, and of which she is much afraid.

When Beauty had been with me for thirteen years she had often fallen asleep with me on the sofa during the afternoon, but I had never thought of taking her to bed with me at night. Then one morning I found her trembling all over, with her chain wound twice round her neck, on the floor of her stand. Probably a mouse, coming in from the balcony at night, had frightened her. The effect of the fright was so lasting that even by the evening she had not recovered, and in her distress clung fast to me. So I took her with me to

my bedroom and into bed. This treatment was successful. Now Beauty goes to bed with me almost every night, and never yet has she soiled my bedroom. She usually plays about a little, with my slippers and so forth, but comes punctually to bed when I put out the light. Her place is then on my right forearm, where she lies all night as still as a broody hen, having first thoroughly kissed me. In the morning we often blink at each other. The eye turned toward me slowly opens as soon as I open my own eyes, but closes again at once if I shut my own. If the morning is dull Beauty sleeps late and does not care about getting up; and even on fine days she seldom moves before I do. The offense of gnawing the bedclothes was soon put a stop to by a few boxes on the ears, and today Beauty knows that it is not permitted. If she attempts it I have only to shout at her and she runs away, with a red face, anxiously purring. This shows that she is perfectly conscious of her guilt. In summer, on hot days, she sometimes sleeps at the foot of the bed.

If I go out in the evening—and Beauty knows at once of my intention—she is greatly excited, and when I come home she usually refuses to come to me, turning her back and plainly showing her displeasure. I may go out in the daytime but not at night.

To my housekeeper Beauty behaves well only when I am not present. If I am at home, she counts for nothing and may do nothing. Sometimes she is not even allowed to lay the table; Beauty runs like a weasel from one corner of the table to another, in order to drive her away. Twice, but only twice, Beauty was

defeated by a stratagem of war. My housekeeper pulled the table-cloth high over the side of the table, and released it as soon as Beauty ran upon it, so that the bird fell to the ground. Since then, even in the greatest heat of battle, she has not again fallen into the trap. During these battles with my housekeeper the bird keeps running triumphantly to me, and usually gives my hand a cordial little bite into the bargain. Now and again she bursts out laughing—and she can laugh very well—or utters short growls. After these battles—which are really only sham fights—Beauty is often angry with my housekeeper all day long. Her anger, like the battle, is merely in my honor. She will accept food from my housekeeper, but never with nods and becks of triumph, as when she takes it from me, even though she will sometimes, while still making her triumphant curtseys, quietly drop the titbit on the floor behind my back. If I then look at her and say: "Must eat now!" the mouthful is conscientiously swallowed.

Beauty's diet is very comprehensive. Her favorite drink is tea, half milk; then cocoa or chocolate, then coffee, but only if very sweet. On drinking out of a cup she always tries to get to the bottom, even if she has to put her head right into it, in order to get the sugar at the bottom. In summer she is very fond of all mineral waters, and when the carbonic acid gas prickles her tongue she always squawks triumphantly; of lemonade too, and she likes to lick ice, or drink very cold water. She does not like water that has stood long. In the matter of food her tastes vary greatly, but whipped

cream, with or without powdered chocolate, is always welcome, while whipped cream with cocoa powder does not meet with her approval! Many human beings would scarcely notice the difference! But the macaw's sense of taste is much finer than ours. Then, all sorts of sweet puddings, rice in any form, but preferably with whipped cream, and all sorts of cooked fruits and vegetables are welcome; also uncooked fruit, bread and butter, and sopped white bread. Beauty is particularly fond of animal fat, lard, butter, and cheese, but will not touch oil or margarine. Pancakes are a favorite dish of hers, but one day she accepted her share as usual, with cries of satisfaction, and then laid it down and would not look at it again. The solution of the mystery was that it was cooked in oil. Potatoes mashed in gravy, soft bones and cartilage, and minced and fried meat she eats with delectation, and also curdled milk served in the North German fashion, sprinkled with bread and sugar; and above all things she likes the skin off boiled milk. She has a strong aversion to any hairy fruit, such as raspberries, and drops them with disgust, repeatedly stretching out her tongue and shaking her head. Bilberries with sugar are turned over in her beak, with every sign of satisfaction, but after the sugar is licked off they suddenly disappear under her tongue, and the moment she is not watched she lets them fall. All this is done with a perfect refinement of slyness.

How greatly my macaw prefers cold, fresh water, and how knowing she is about it, I realized one summer when I had a long illness. Beauty had been a long

time in my room, so I offered her some water in a glass standing on the bed-table. The water had been standing and Beauty refused it. Later I had some fresh water brought, and before I could take the glass myself Beauty was on the bed-table and drinking the fresh cold water, just off the ice, with the greatest satisfaction. She had long known the difference between fresh and standing water.

Beauty displays great dexterity in opening sugar-basins, cheese-dishes, and the like, in order to help herself. In the case of glass cheese-covers, she tilts the dish until the cover falls back, then drops the dish and helps herself. This trick the bird has thought out for herself and has not imitated from human beings, who of course lift the cover instead of tilting it off. She opens sugar-basins by taking hold of the cover under the knob and turning it over so that it lies on the basin upside down. She then seizes the projecting rim of the under side and throws the cover off. She employs this somewhat roundabout method because she cannot hold the round knob in the tip of her beak for more than a fraction of a second, as it slips out of her hold.

She is fondest of opening red basins, and tapping red books with her tongue; she knows very well what may be torn and what may not, so that her satisfaction is all the greater on tearing worthless red paper to pieces. Red is, on the whole, her favorite color, and she is always delighted when she can eat from a red plate. If I am wearing a red tie, or even a tie with red in it, she invariably pulls it out of my waistcoat. Red

carpets are her favorite playground. We often play together on a red carpet or a red coverlet, in which case, of course, I lie down. Then I can roll the bird to and fro, and best of all round and round, with the head as centre. It is like playing with a dog. Dogs get rougher and rougher as they play; so too does Beauty, while her face grows red as a rose and glowing hot. I have never known gray parrots to play in this way, whereas Beauty invites me to do so! When I am reading or writing, for example, she will pull off my slippers and throw them in the air, and then come back and bite my feet, and so forth. She is fond also of playing on the table, waltzing round and round, but prefers the bed or the sofa. In the excitement of play she often jumps, after a short run, taking off with both feet at once but without opening her wings, a distance of eight or ten inches—a sight irresistibly comical—and turns a regular somersault.

At other times my macaw is usually enthroned on my shoulder, whether I am sitting down or lying on the sofa. If I fall asleep she does the same, and I have often waked, after an hour, to find her still asleep. She is also very fond of hanging on to my waistcoat and spreading her wings or sweeping her tail in front of my face, to interrupt my reading and make me devote myself to her. When I am writing she often climbs down from my shoulder, and if I am not on my guard she will snatch my pen-holder and hastily climb back to my shoulder. However, she does not disturb me if she has some soft wood, cardboard, or paper to tear

to shreds. On the other hand, she is fond of biting off buttons, and just when she is most submissively snuggling up against me to be stroked.

She has a remarkable passion for eating masticated food, or taking it from one's mouth. We should probably not be mistaken in regarding this habit as erotic in its basis, as are so many of the parrot's actions. Its play at all events has undoubtedly an erotic basis. Beauty will also bring food out of her crop and try to feed me with it.

Like many human beings, Beauty suffers greatly during dull or stormy weather; she is nervous, nothing pleases her, and continually bunches herself up. Macaws are creatures of the sunlight and love the sun above all things.

Sitting in the sun on the balustrade of the balcony, Beauty learned to speak Italian; thereby attracting the attention of admiring passers-by: *Lora, Loretto, va bene, quà*—all Italian words. She has learned no German beyond *komm* and *Lorchen,* for when we are together the contemplative calm of the balcony is lacking. Beauty, however, has learned only to chatter: she does not properly speak, saying nothing which could be of advantage to her or which she connects with definite ideas, as the gray parrots do. She chatters almost exclusively on the balcony, and then, as a rule, only when alone and in good spirits; but when feeling extremely triumphant she will sometimes go so far as to cry "*Lora!*"

Especially after bathing she is very talkative, and also when there is a great deal of movement in the

street under my balcony, when children call to her, or older folk admire her. She also chatters in the greatest excitement when I am going out, but if I leave the house by the door leading into the gardens my departure makes no impression on her. Her behavior in the evening is remarkable. She will often hang on to my necktie, gaze at me, and say, quite softly and tenderly, "*Lorchen!*" [1] Almost always, too, she says this at night, when I am in bed and she is crouching on my arm, and I have turned out the light. My hands have to be kissed, and then she seeks my face, and utters a soft, tender "*Lorchen*" before she settles down to sleep.

On the balcony or the window-sill she is often overcome by a longing to bathe. At first she always returned from the balustrade to her stand and bathed in her small drinking-trough. There was a great deal of noise over this business, and a great splashing of water; she also absorbed a good deal of water—for, curiously enough, she continually drinks while bathing. She would not, however, accept a larger trough. Then I tried the following stratagem. For a week I used a baking-tin for her food-trough, and finally gave it her for a bath, and it was then accepted without further demur. Beauty plainly expresses her intention of bathing by continually clapping her wings, unfurling her tail and emitting sounds between a purr and a growl. When bathing she will now and again step out of her bath, make a brief and triumphant progress round the tin, circling round it two or three times

[1] The equivalent of "Polly."—*Tr.*

with proudly erected head and tail, her wings a little drooping; and so back into the water.

In addition to these cold baths, Beauty is also washed with warm water and soap. She finds this less delightful, but it is good for her, keeping her clean and free from mites. And in bathing her in warm water I made the discovery that the blue of her feathers loses some of its depth in the bath, as do the red feathers of the turacou, even in cold water—but with this difference, that the blue of the macaw's feathers does not completely wash out. After drying they become as blue as ever; they lose only a little of their dyestuff, which seems more abundant than in the turacou. The bath-water is perceptibly tinged with blue, and looks rather like water "blued" by the washerwoman.

Beauty is very shy with strangers, but prefers men with little or no hair on the face; she hates men with long beards or bushy heads of hair. Once, when a well-known Dutch scholar was calling on me, Beauty raged at the sight of his long hair and beard, and wanted to attack him, so that she had to be carried away. I have a friend for whom the bird cherished very kindly feelings, but during an absence of some weeks he grew a full beard—it really was rather a dreadful beard—and on his return Beauty bit him. She could no longer endure him. In other respects, and in general, she is good and not treacherous. If I say to her, "Mustn't bite!" she does not bite, grievous as the prohibition may often seem to her when strangers take her on their fingers. Her one idea on such occasions is to get back

on my shoulder. But in the case of the Dutch professor Beauty flatly refused to obey me!

Embarrassment finds two forms of expression in Beauty. First, in the constant lifting of one foot—as when she is sitting on a stranger's hand. This means "Take me away!" And in other unpleasant positions, when she wants very badly to get away, she assumes this position, as she does when defending herself. And again, she will stand with drooping head, as though pondering—for example, when she wants to come up on my shoulder but does not know whether she may, and is awaiting my invitation, and also when she longs to eat or to bite something and is uncertain whether she may do so. Some dogs, in such circumstances, will scratch themselves as loudly as possible, in order to draw attention to themselves—for example, when they want to jump up on a chair and know they may not do so without permission.

But with strangers in general, provided they show no fear of her, Beauty is perfectly good-tempered; but the slightest sign of fear or trepidation, the withdrawal of the offered hand, impels her to bite. This biting is an instinctive defense against uncertainty, against possible danger. It is found even in the tamest animals (as in the bear Teetjen), and even in domestic animals—for example, in horses. Even horses will snap if touched unexpectedly. Here again we see the mistake of surreptitious patting: the horse cannot see one approaching, and is therefore startled.

Macaws have a remarkable aversion to the striking

of clocks, whether church or turret or household clocks. When a clock strikes, Beauty at once climbs upon my shoulder, shaking her head at every stroke and raising and rustling her plumage a little. Her ears are so sensitive that she can hear the most distant city clocks, which are scarcely audible to me even when I listen for them.

She has a curious fear of such large objects as poles, planks, ladders, and baskets. If she sees such an object she utters a hideous shriek, and is apt to lose her head, tumbling back off the balustrade or flying into the room. Do such things evoke old memories?

Aeroplanes have ceased to impress her: not so airships, and, above all, captive balloons.

Curiously enough, on the other hand, small baskets —such as letter-baskets on a writing-table—have an extraordinary fascination for the bird. There is no getting her away from them; and it is the same with small boxes—cash-boxes and the like. One of her special treats is to help to open parcels and rummage about among the contents, or throw them out, and she likes to do the same when I open a trunk or drawer. Beauty is inside it in a moment, and if I want to give her a special treat I open one drawer after another. Then she puts them all in order—in her own particular fashion! Curiosity is one of her chief characteristics; none of my other parrots were so conspicuously inquisitive. Is this because Beauty belongs to the so-called fair sex? Be that as it may, she has to see everything; she stoops far out over the balcony to see what is happening underneath, and when I have a caller

cannot rest until she has seen him. Male callers are of course greeted with especial amiability.

I must not forget to mention her special love for flags. The bright colors of the Italian flag inspire her with absolute enthusiasm. When she sees this flag she flies to it and sits on the staff like a hen on her nest, and if the flag is flown from the balcony she mounts guard over it, in the blazing sunshine, and is particularly delighted if the wind wafts it upon the balustrade. Then Beauty sits on it and kisses the red section with special fervor.

Toward other birds her behavior is very different. If I take her with me, sitting on my shoulder, to the parrot-cages in the gardens she clambers nervously up to my collar. Generally speaking, whenever she is taken into the open air she is timid and nervous and always sits as though on the point of flying away. For single parrots, by the way, a string is a great improvement on the usual chain. It is easier, and offers less resistance to the beak and therefore less inducement to bite it. Moreover, it can be made as long as desired, while a chain cannot, on account of its weight, and so the bird will have more freedom of movement. When two parrots are together one will often bite through the other's string, but never its own.

Of the young lions and others which were reared in my house Beauty was not in the least afraid, but pecked them on the head if they came too near, whereupon they drew back. Neither was she afraid of the lizards which sometimes climbed up the creepers to the balcony.

A great delicacy, more welcome even than ants' eggs, is a mess of meal-worms, which she masticates with intense satisfaction. One may conclude from this that the macaws in the wild state are not purely vegetarian in their diet, but likewise eat larvae, such as they would find in rotting wood. Her general *mœnu* points to the same conclusion.

I have already described her attitude toward the smaller parrots. With other macaws she behaved quite differently. When Jacob came to me he was so weak that he could scarcely hold himself on my hand, and wanted only to drink, and drink again. He was also devoured by mites, so he was promptly given a bath. I pulled out some long broken feathers, and six weeks later you would scarcely have known him; he was clothed wholly anew. I then introduced him to the blue macaw, and from the first they were fast friends, except that when I appeared Jacob sometimes got a peck on the head. This was in testimony of Beauty's unshaken loyalty to me. In the same way a monkey, conversing most amiably with a friend, will attack him a moment later when the more useful and important keeper appears.

At meal-times, however, the two had to be separated, since Jacob ate for six; particularly rice. Unlike Beauty, too, he had bad manners, shrieked loudly, and had an indescribably stupid face. The poor creature had been bought from a small dealer, and may have had a mournful past behind him; undoubtedly so, to judge from the cruelly emaciated condition in which he arrived. When Jacob had recovered his strength

he was sent to the gardens, where he became the accepted lover of the tailless green-winged macaw; and when I visit him he rejoices as far as his jealous mate will allow.

A later guest was Ramiro, a fine blue macaw. When he was introduced to Beauty there were great mutual rejoicings. Ramiro kept on whistling for joy, with his pupils dilating and contracting, while Beauty made advances to him. Soon they were sitting together on the balcony, in the closest intimacy, preening one another's feathers, with their heads in opposite directions. Yet if I happened to interrupt this affectionate *tête-à-tête*, Ramiro would be given a tap on the head, for the reason already explained. And at meal-times Beauty would stand no nonsense. When they were sitting together on the parrot-stand, if Ramiro sat on the foot-tin, or began to eat, Beauty would twist and turn, in front of Ramiro, behind him, or under him, until she had got to the tin herself and pushed him aside, refusing to let him eat any more. They had therefore to be separated at meal-times. Ramiro was a good bird, though not particularly refined. He had always been regarded by his mistress more as a thing of beauty than as a creature with a mind: his mind had been neglected. After his return to his mistress he was for weeks homesick for his new friends.

Like all parrots, my Beauty is jealous. When I first had her she had not yet made the acquaintance of the looking-glass. One evening I laid a mirror flat on the table and let her look into it. Her cheeks grew red, her feathers bristled, and her head bobbed down and tri-

umphantly up and back. When I began to caress the bird in the glass it was another story. She struck furiously at the glass, and then kissed my hands and face with the tip of her tongue. She was so enraged and excited that I put the glass away. I made the same experiment with an upright mirror, and she at once began to pull at the side of the mirror, in order to look behind it, and presently the deception was realized. Today she no longer looks at the bird in the glass, however much I may flatter it. She has detected the imposture.

It is another matter with her shadow. If she suddenly catches sight of this she always begins to peck at it, and is even jealous if I speak coaxingly to it and stroke it, pulling my hand back and becoming greatly excited. She does not seem to have grasped the meaning of a shadow. Sometimes she does not even like me to speak to another person, and strikes at the air in his direction, and then takes hold of my nose or lips in order to draw my attention to herself.

If I left it to her, Beauty would spend the whole day on my shoulder. When I am in the room with her she continually comes running to me—not flying, for like all macaws she does not fly very well. When she does on occasion fly she usually lands elsewhere than where she intended; sometimes on my head. As a rule, however, when she flies she does so at random, having lost her head out of fright—as when men pass the house carrying large objects, or when something falls down with a clatter, or when a broom comes too close to her; for she is terrified of brooms, whereas she is

not frightened of brushes, and angrily bites at them.

Beauty has much more initiative than my gray parrots. She knows what she wants, and does it; for example, she always comes to me of her own accord, and even runs through the house after me. She makes her wishes known when she wants to go out on the balcony or the window-sill. If she sees that the sun is shining out of doors but not into the room, there is no holding her; she has to go out. But if the sun goes in, or it is growing cold, she raps on the windows to be let in.

Like the gray parrots, Beauty is never weary of caresses, but growls at once if anything does not please her. She is easily moved to scolding, like all the macaws, and is soon angered, but soon appeased and as quickly good again. But she becomes really ill-tempered if the window is not opened quickly enough at her tapping; and she has nothing to learn in the art of sulking; she will remain cold and obtuse to all signs of affection, and will accept no food.

It is hardly necessary to say that so affectionate a creature suffers greatly during her master's absence. Our longest separation lasted for some three months, when I lay in a nursing home, very ill with typhus. When I returned, the little creature clung fast to my necktie, gazed at me, her face a bright red with excitement, and continually kissed my nose and cheeks. During this time she had been the guest of people who were great lovers of animals. On another occasion I went on leave for six weeks, and Beauty was left alone with my housekeeper. She told me that the bird ran every day into my bedroom, and all over my bed, con-

tinually kissing the coverlet. Our meeting after this separation was as touching as before; and my housekeeper at once fell out of favor, for now that I was home again she had become superfluous!

Thus we have always been and still remain good friends, and have learned to understand one another. Each of us always knows what the other wants, and it is astonishing how intimate one may become with an animal. But I must emphasize one thing—that if one wishes to enjoy an animal's society, and to make of it a friend and comrade, that end can be attained only by mutual sympathy and understanding. Blind obedience one must not demand, at all events from a free-born creature. The problem is to find a *modus vivendi.* We can really enjoy the company of our animal friends and companions only if their individuality is fully developed and preserved.

SOME OTHER BIRDS

OF the other birds in our gardens I can mention only a few.

A very intelligent and interesting bird is the Australian laughing jackass or giant kingfisher. Its name refers to its voice, which has the sound of laughter; and this is an expression of joy and well-being. With its laugh the bird greets its keeper and other acquaintances. Its friendship is not difficult to win. An occasional gift of a mouse suffices. It will be thankfully received, and swallowed whole. With a grateful mind, and to recall itself to memory, it subsequently greets its friend with a ringing laugh. In our zoological gardens, as in its native land, it is one of the most popular of birds; a bird which would assuredly afford much pleasure to private owners. Perhaps its rather intimidating beak explains why one rarely finds it in private houses. Of late years, too, fewer specimens have come to the gardens.

Starlings are delightful companions. When I was a schoolboy I had two, who, like my parrakeets, bore the names of Max and Moritz. Both were cocks, and one of them was found in a wood, sick, and with a crippled wing, and quite wet through. Although an adult bird, he grew even tamer than the other. Max and Moritz were kept at liberty, and used to follow me all over the house; indeed, at the word of command, "Into your

cage!" they would even return to their cage at the double! When their large cage was being cleaned—as was often necessary, for starlings are terribly dirty birds—they were put into a two-story box-cage. Even then they obeyed, and at the word of command returned promptly to their emergency cage!

It is remarkable how readily starlings may be tamed. You have only to tackle them through their love of food—for example, give them their beloved meal-worms in your hand. At first it is best to let the bird see only your hand, yourself remaining concealed, and to put the bird in a small cage, so that in leaping to and fro it continually collides with the hand holding the meal-worms. In the end the stomach and hunger will overcome fear and the mind, and then the spell begins to work, for the bird will recognize the hand as harmless, and indeed beneficent, when it always sees it reappear with meal-worms. In a few days' time you can show yourself, and even in a large cage the bird will now come to your hand for its food.

The starling's love of bathing is extraordinary. Max and Moritz had outside their cage a separate bath-cage, the whole bottom of which was occupied by a roomy zinc trough; otherwise the floor of their cage would always have been a swamp. As it was, no matter how often their bath was filled, it was almost always empty. Once Moritz took it into his head to bathe in a water-can. He simply threw himself into the water. I had to fetch him out, for being wet to the skin he could not get out by himself. Fortunately the can was only half full.

When both birds were running about the room they used to come on my knee and shoulder and beg for meal-worms. Even in bed they would seek me out. Their appetite for meal-worms was always their motive of action. Earth-worms they disdained.

Only for a few years did I enjoy the society of these imps, for one day I came home from school at noon and found Max dead in the cage; Moritz had in some unexplained fashion flown away. A painful memory of my youth! Of the European singing-birds the starling is undoubtedly the cleverest and most amusing, particularly in captivity.

A siskin which I had when a schoolboy, and which lived in its cage for seventeen years and was always taken out on to the balcony in summer, proved to be a mimic. It imitated sparrows and canaries to perfection, and during the last years of its life its song was a combination of the songs of sparrow, siskin, and canary. My sister, who was then quite little, often amused herself, if she was not observed, by removing the little creature's seed-tin, so that it was often left without food. Consequently the siskin hated her, and when she went near its cage rushed at her with open beak and wings, in order to bite her. One sees how plainly even these little birds distinguish different persons.

Of our native finches I have always had a particular affection for the bullfinches. But they must be reared in captivity; not wild birds caught in maturity. There is no pleasure in keeping them, for they never grow tame. The best bullfinches come from Czecho-Slovakia,

where the breeding of these birds is a special business.

My first pair consisted of a big tame cock-bullfinch from Eastern Europe and a little hen. This was the only pair that could be kept together. But when the cock contracted an affection of the eyes, which often happened, they had to be separated, since then the hen ill-treated him, for she was a regular Xantippe, and had the whip-hand of her husband. This remarkable affection consisted of a scaly eruption, the size of a threepenny bit, over the left eye, which became badly swollen. I then removed the eruption, which was very hard, washed the eyes and surrounding parts with tepid water, and anointed the bare rather raw skin with vaseline. Unfortunately, the malady recurred each year, although the bird bathed a great deal. Schlag, in his book on the bullfinch, states that the cause of the disease and the remedy are unknown. I certainly know of no remedy, though the trouble can be cured for a time.

When this big fellow was let out of his cage he had unfortunately a bad habit of flying round and round under the ceiling, or hiding himself, so that it was better not to let him loose in the room. Otherwise he was quite tame and ate meal-worms out of my hand, and pieces of apple from my mouth. With his love of hiding himself he once played me an annoying trick. I was living in Berlin, in a furnished room, and while I was dressing I usually let the birds out for a while. But one day, when I wanted to shut them in the cage, the cock was missing and could not be found. He was

necessarily in the room, however, for door and window were closed. With the help of the servants I turned the bed and sofa upside down, for I thought he might be sitting among the spiral springs. All was in vain. I then promised the finder a good reward, since I had to go out. When I returned in the evening the bird had not been found. Tired as I was, and depressed, I sat down on my bed. Then something fluttered under me out into the middle of the room and there lay exhausted. It was my bullfinch, dirty, and with his feathers full of dust, and anxiously chirping. He had spent nearly twelve hours in the mattress. How the bird had come to creep into the dark space between the spiral springs I cannot imagine, for birds instinctively make for the light, for the windows, or for a white ceiling, flying round under it and striking against it in the belief that they can get through it. Neither can I explain how the bird remained undetected when the reversed mattress was searched by three persons with lighted candles. It was only by good luck that he was not crushed to death between the springs.

The hen, when she came to me, was a regular Humpty Dumpty, with no tail and miserable wings—and I was not sorry for this. She remained hale and hearty, while a later arrival, who was faultless when she came to me, died in three weeks. For a whole year Pussy, as I called her, had only one tail-feather, and this always waggled to one side if she was excited, when she looked indescribably comical. The big cock was afraid of her. Only once was he too much for her. Sand and feathers flew

in all directions and Pussy was overthrown, and anxiously piped for help. From that hour she was less arrogant.

She laid repeatedly; unfortunately, the eggs were always infertile. She always scattered the nest, and displayed no inclination whatever to sit. She only pulled the nesting material out of the bundle provided and dragged it hither and thither. She usually had her bill full of lint.

The play instinct and the destructive instinct were strongly developed in these birds. If, for example, I hung a piece of string in the cage it would be torn to shreds, while they angrily fought over it. In a breeding-cage they threw the nest-baskets on the sanded floor and then fought with them and dragged them to and fro. They were particularly fond of swinging, and they liked rummaging in the earth in flower-pots, and then angrily attacked any one who went near them.

The other pairs I had were always of the small West European variety, but could never remain long together, for their life was an almost continuous battle; moreover, they never sang. One hen, put into a cage with other birds, began to fight with all of them, sprang into the swing, and there remained, stuck fast and helpless, since she dared not jump down from her swaying perch, but called for help until she was rescued.

Bullfinches eat all sorts of fruit, cooked or uncooked, and are especially fond of service-berries, bilberries, and cherries; also of many sorts of seed, ants' eggs, and meal-worms, which they eat piecemeal. The latter are best given dead, or the bird should be induced to bite

off their heads; otherwise it may happen that half the worm will creep away, and the bird will devour it by mouthfuls, the head last! They are especially fond of pippins and the buds of oak-, willow-, hazel-, and fruit-trees, and in a less degree of lime-tree buds.

In a small room, with no hiding-places, the birds may safely be left at liberty. They are tamest and most amusing by artificial light; then one can take them in one's hand and feed them.

A remarkable characteristic of the bullfinches is the variability of their moods. Now they will kiss you, prettily coquettish, and hop about with tail askew and ruffled plumage; next moment they will slap their wings and bite your fingers, nose, or lips, and angrily peck to pieces the bits of apple offered them; and now and again they will fly furiously against the bars and fight and bite. But their anger goes as quickly as it comes, and the same bird is suddenly stricken with timidity.

Bullfinches prefer to kiss bearded lips; my birds would hardly condescend to notice a clean-shaven mouth.

Bullfinches even when in their cages will often quarrel with the inmates of another cage, even at some distance from them. If there are bullfinches in the other cage the tiny brawlers will run threateningly to and fro. But their great tameness, their pretty song, and particularly their trained piping, with their beauty and their droll ways, make them, next to the siskin, the most attractive cage-birds among the European finches.

It is a remarkable fact that hermaphrodites have repeatedly been observed among the bullfinches, one side

of the body exhibiting the male and one the female plumage. The striking difference of coloring in the two sexes may explain why hermaphroditism has been detected more frequently in them than in other birds in which the sexes are similarly colored, or in which at all events they differ less widely than in the bullfinch.

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